

# KERAMIC STUDIO

Vol. IX. No. 12

SYRACUSE, NEW YORK

April, 1908



E have opened in this number a new department under the title of "Happy Study Hours." It is especially for the home workers and students who have no access to teachers in the larger cities. We are sure that these articles are going to be very helpful and you can help them to be more so by writing about your own special needs and troubles to the "Happy Study Hours" department, KERAMIC STUDIO.

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We call the attention of our readers and especially would be designers for reproduction, to the letter from the Central City Engraving Company's manager; it is remarkable how few know the proper way to prepare designs for publication. Because a design looks well on Japanese tracing paper, or in color, it is taken for granted it will look well in reproduction. But the little light or glistening spots in the tracing paper all show in the reproduction and give a mussy, spotty effect. India ink on Bristol board or black and white wash drawings on a smooth paper or, as Mr. Minor suggests, sepia, give much the best effect. A rough paper shows also the mottled effect of its little shadows and makes a poor reproduction.

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*To the Publishers of Keramic Studio:*

GENTLEMEN—Having had several years experience making engravings for your publication, I am satisfied that there might be much improvement in the quality of your illustrations if the design contributors understood better the requirements of the engraving processes to which their work must be subjected. In order that justice may be done to the efforts of the artist, it seems desirable that we "get together" for the mutual good of all concerned.

That you receive many beautiful studies which are desirable copies from the engraver's standpoint, will not permit us to overlook the many others from which no amount of skill and process handling could ever produce satisfactory plates.

Allow me therefore to suggest that you accept for publication *in one or two colors*, only drawings made in monochrome. The best half tones are made from wash drawings in sepia with burnt umber for the deeper shadows. These wash or brush drawings should be made on a suitable surface, *not too rough*, as the action of the lenses, during the making of the half tone negative, will reproduce the grain of the drawing board or paper at the same time that they reproduce the various shades in the drawing itself.

Of course when the plates are for supplement subjects in colors, the drawings should be made in full color, but for reproduction in one or two colors, *never*. The artist should bear in mind the actinic values of the different colors of the spectrum in the following order: Violet, Indigo, Blue, Green, Yellow, Orange and Red, remembering always that the lighter colors visually, like yellow and orange, if put into the drawings, will reproduce darker than the colors

nearer the violet end of the spectrum. Thus the relative values of the different colors in the copy will be more or less changed in the reproduction.

All pen drawings should be made on a fine, smooth quality of Bristol board, using jet black drawing ink. Occasionally designs made on a rough board with black crayon (not pencil) can be reproduced by the engraving process with the interesting and artistic spotted effect of the copy, but of course this process is to be recommended only in exceptional cases.

Studies should not be made smaller than the size they will have in the reproduction. The enlarging of a copy is seldom satisfactory. But studies can be made larger than the size of reproduction, as they will not suffer from reduction in the engraving process, on the contrary will often be improved by it.

Copy should never be folded or creased.

It might be a good business proposition for the KERAMIC STUDIO to furnish to its art contributors a moderate quantity of the proper materials necessary to produce the desired effects.

Should any of your artist friends care enough about this matter to take it up personally with me, it will give me pleasure to answer any possible inquiries on the subject, without further encroaching on your space.

Very truly yours,

I. L. R. MINOR,  
Central City Engraving & Electrotyping Co.,  
Syracuse, N. Y.

## LEAGUE NOTES

The annual exhibition of the National League of Mineral Painters opens at the Art Institute, Chicago, the evening of April 28th, two days earlier than the date given in February number of KERAMIC STUDIO. It will remain until May 26th and then will be exhibited in its entirety at Burley and Co's. 120 Wabash Ave., for one week.

The Chicago Ceramic Art Association and the Water Color Exhibitions will open the same evening. Members of the League may secure cards for themselves and friends by applying to the Secretary of the League. The Exhibition Committee of the Municipal Art League have arranged a special Gallery Tour May 14th for the Ceramic exhibition at which the President of the N. L. M. P. has been asked to speak on Ceramics. These Gallery Tours are arranged for the benefit of the fifty-six clubs of Chicago and Cook County affiliated with this Exhibition Committee and are largely attended by their members. It is evident that the interest in Ceramics is increasing.

Every League member ought to be represented by one or more pieces at this exhibition. The honor of having one's work pass a critical jury and exhibited at the Art Institute is as gratifying to the china painter as to any artist. Entry blanks containing directions for sending the work have been mailed to every member. Those who wish to send work for exhibition in *Chicago only* should mark this plainly on their entry blanks, otherwise they will be sent with the traveling exhibition. These entry blanks should

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be mailed to the President of the League previous to shipping the china. The date for receiving entries at Chicago is April 20th. They will be submitted to the jury April 24, this will give time to arrange and catalogue them in time. It will be difficult to insert other pieces after the cases are arranged without destroying the whole effect as the backgrounds will be specially selected to harmonize with the colors in each case.

The annual meeting of the League which is open to all members will be held at the Art Institute May 5th in the morning from nine-thirty to twelve o'clock. Afternoon two to five o'clock. Amendments to the By-Laws will be voted on, also plans for the coming year. Every criticism or suggestion which has been or may be sent to the Advisory Board in reply to request made in our Finance Report issued last June will receive careful consideration. The work of the Advisory Board has been arduous the past year, made more so by the lack of printed matter. It is thought after the annual meeting there will be sufficient money in the Treasury to print and distribute information in regard to the League and its work in a more business like way.

At the last Advisory Board meeting an unexpected enthusiasm was shown, as letters were read and reported from different cities showing a great increase of interest in the League. At this meeting plans were made for placing the study course on a self supporting basis, these plans will be presented to the members and decided upon at the Annual meeting. We expect a great increase in membership from the cities and towns in the middle and far west who must look to the greater educational centers like Chicago and New York or Boston for expert instruction.

We hope by July first to have printed statements ready to mail to every person whose name appears on our mailing list. Any college School, Club or Individual interested in designing particularly for ceramic forms will do well to request that their names be added to this list. It is criticism of the highest order that the League offers—helpful alike to the professional and amateur. We have members who have written us this year offering twice the price of our entire course for a single criticism on other than the shapes selected by the League. These requests have come from members who have studied under good teachers and understand the value of our criticisms by Miss Bennett, whom we have been fortunate enough to engage for another year.

Individual members should watch for the League Notes in KERAMIC STUDIO, these will keep them informed on all League matters outside of the Study Course Criticisms.

It should be evident to all, that the officers of the League can not write many personal letters to members, to do this it would be necessary to employ a stenographer. This would be impossible without raising the yearly dues and this we do not contemplate. These dues of one dollar for each member are due May first for the year ending May first, 1909. Upon receipt of these dues from members their names will be placed on our membership list for the year, and literature issued by the League will be sent as soon as published. New members are required to pay an initiation fee of two dollars in addition to the yearly dues. This initiation fee is not required from members of affiliated clubs of five or more League members. Application blanks for membership will be mailed upon request.

MARY A. FARRINGTON,  
4112 Perry Ave., Chicago,  
President of N. L. M. P.



Large Sevillian panel, XVI century, in the Metropolitan Museum of Art,  
by courtesy of the Museum.

#### METALLIC DEPOSITS ON GLAZES

(CONTINUED)

*Louis Franchet*

I have prepared a translucent glaze fusing at 970° C. (Seger cone 09), which I will call glaze A, and which is composed of:

Quartz.....	12
Sand of Decize.....	20
Kaolin from Eyzies.....	2
Cornwall stone*.....	10.5
Red lead.....	30
Cristallised borax.....	19.2
Cristallised boric acid.....	2
Dry carbonate of potash.....	2
Sodium chloride.....	1.8

This mixture is ground, sifted through sieve No. 60, fritted and then ground wet.

With this glaze A I made the following combinations:

No. 1a	No. 2a
Glaze A..... 100	Glaze A..... 100
Kaolin..... 10	Kaolin..... 10
Silver carbonate..... 2	Zinc oxide..... 1
	Tin protoxide..... 1
	Silver carbonate.... 0.5
	Copper oxide..... 3
No. 3a	No. 4a
Glaze A..... 100	Glaze A..... 100
Kaolin..... 10	Kaolin..... 10
Subnitrate of bismuth 4	Silver carbonate.... 2
Silver carbonate..... 2	Copper sulphide.... 2
Copper carbonate..... 1	
No. 5a	No. 6a
Glaze A..... 100	Glaze A..... 100
Kaolin..... 10	Kaolin..... 10
Copper sulphide..... 0.3	Zinc oxide..... 1
Silver sulphide..... 2	Tin protoxide..... 4
	Copper sulphide.... 0.5

Each of these glazes is ground with gum tragacanth which makes it possible to apply it evenly over the ware. It is applied like any other glaze with the brush or the atomizer, or by dipping. The fusibility may be increased by reducing the amount of kaolin or decreased by the addi-

\*Cornwall stone or pegmatite should not be confounded with feldspar. It is a mineral similar to feldspar but richer in silica and less fusible.

tion of five to eight percent alumina. Similar glazes may be prepared for grès and porcelain.

I fired these glazes in an ordinary muffle, provided at the base of the chimney with a damper, which closes hermetically to prevent the oxygen from the air combining with the carbon monoxide during the reduction.

When the temperature at which the glaze is developed is reached, I let the fire go out and the muffle cool down to a red glow, when I give the reduction or smoking according to the method which will be described further.

With these metallic glazes the variations in color of the metallic deposits are much more sensitive than they are with the metallic mixtures applied over the glaze according to the old process. With glaze No. 1a I was able to study the changes produced by the longer or shorter time of the reducing action, and to understand how in the XVI century the golden, yellow and brown tones of the iridescent faïences of Diruta were produced. The time of reduction was certainly very closely watched by Xanto and Giorgio Andreoli.

Thus glaze No. 1a passes through five different stages: First stage—Brass metallic tone.

Second stage—Gold metallic tone.

Third stage—Yellow brown tone, few metallic reflections.

Fourth stage—Blackish brown tone, few metallic reflections.

Fifth stage. Black tone, no metallic reflections.

The gold tone of the second stage has such a remarkable brilliancy that it may be taken for gold. But when gold itself is introduced into those glazes in any form it does not seem to have any action whatever.

In the three last stages the metallic brilliancy disap-

pears but if the ware is fired again in an oxidizing atmosphere, and then submitted to a new reduction, the metallic reflections will reappear either with the brass or the gold tone.

Glaze No. 2a retains the copper appearance with varied iridescent reflections caused by the presence of silver oxide.

Glaze No. 3a shows the intense action of bismuth oxide, as it always has a strong blue tone which entirely overcomes the colors determined by copper and silver oxides. This blue glaze is generally mat with a more or less marked mother of pearl effect; when combined with glaze No. 1a it gives a green metallic deposit of very brilliant color having also nearly always a mother-of-pearl effect.

Glazes No. 4a, No. 5a and No. 6a give deposits with very brilliant and varied iridescent reflections. No 6a is generally mat.

I have also tried these glazes, using in place of metallic salts the corresponding minerals, replacing subnitrate of bismuth by bismuthine ( $Bi^2S^3$ ) and the copper compounds by chalcosine ( $Cu^2S$ ), covellite ( $Cu S$ ), chalcopyrite ( $Cu Fe S^2$ ) and philippsite ( $Cu^2Fe S$ ). The deposits were good but generally of a darker tone. We know that the old potters prepared their copper and silver sulphides themselves, as is shown by the manuscript of Martinez de Frugo.

Some Italian potters who work in the Golfe Juan and Vallauris potteries introduce into their mixtures pulverized charcoal or bone black, but this substance does not seem to have any particular action, neither has the use of copper sulphate instead of copper sulphide.

The many experiments which I have made convince me that free sulphur or sulphur combined with the metals is not absolutely necessary (formulas Nos. 1, 2, 3, 4, 5 and 1a, 2a, 3a), neither is ochre (formula No. 6). Cinnabar has no



Hispano Moresque plates in the Metropolitan Museum of Art, by courtesy of the Museum.

action. Silver and copper may be used either as oxide, sulphide, carbonate, arseniate, phosphate, chromate or any organic salt; however, when these metals are combined with sulphur, the deposits have a red tone which is produced only exceptionally in other combinations. Silver chloride may be used, but, as it is volatile at a very low temperature, the results obtained with it are not constant and it has some action over surrounding pieces. I have also tried arsenic and antimony in different combinations but without any results.

#### GRINDING OF THE METALLIC MIXTURE

I have tried to find out what could be the action of vinegar which the Moors used in their grinding, especially so as this tradition has been faithfully preserved and the Italians who work in the Golfe Juan and Vallauris potteries are convinced that it is absolutely necessary in order to obtain successful results. I have prepared the Moresque formula and divided it into five parts which I have respectively ground with vinegar, gum tragacanth, dextrine, essence of turpentine and fucus.<sup>1</sup> I have applied these different mixtures on the same piece of glazed faience and have found that results were identical in every case. There is consequently no reason to use vinegar, which was formerly used for lack of a better product, as ceramic colors are always more easily applied when added to some organic matter in place of water. In practice gum tragacanth and fucus are the most convenient and should be generally used.

The metallic mixture is applied over the glaze to the depth of about one and one-half millimeter, and very varied iridescent color effects may be obtained by making, for instance, a design with a copper mixture and covering the whole piece with a silver mixture, or vice versa; the design will appear in more vigorous tones and these tones may be varied ad infinitum by the superimposition or juxtaposition of the different mixtures.

#### INFLUENCE OF THE UNDERLYING GLAZE

The glaze or enamel over which the mixtures for metallic deposits are applied plays an important part in the final result. The underlying glazes which are the most favorable to the production of brilliant deposits are those containing oxides of copper, cobalt, iron, antimony, nickel and chrome, especially in presence of tin and lead. The Moors evidently knew this for they always applied the iridescent mixture over white and blue plumbostanniferous enamels.

The glazes which must be used in preference to all others are green and turquoise glazes of copper, and the blue ones rich in cobalt. At Golfe Juan and Vallauris the former are generally used.

The finest ruby reds are applied over a green glaze corresponding to:

Feldspar.....	7
Quartz.....	33
Sand of Decize.....	19
Carbonate of potash.....	6
Carbonate of soda.....	5
Red lead.....	25
Copper oxide.....	5

This mixture is thoroughly blended, then fritted and ground wet.

Very fine color effects are obtained over a turquoise glaze which has been splashed with spots of a grey or celadon glaze made from nickel oxide.

Lead glazes colored red by chrome oxide are also very

1. *Fucus crispus* is much used by European ceramists who call it *lichen*. It is a sea weed very common in European waters

favorable to the production of iridescent reflections, the more so as they have a natural tendency to become iridescent by themselves under the influence of atmospheric agencies.<sup>1</sup>

#### FIRING AND REDUCTION

The firing of metallic deposits requires great care, because the ochre mixture which determines them must not be incorporated into the underlying glaze, and on the other hand the metallic coat must adhere sufficiently not to be rubbed off by contact with hard substances.

Old potters, notwithstanding their empirical methods, fired to the right point, as can be seen from the many specimens they have left us, on which metallic deposits have resisted the wear of age very well.

Having used a glaze the point of fusion of which is 990° C. (cone 08), I have observed that the point of firing must not exceed 650° C. (cone 020), otherwise the ochre mixture is incorporated into the underlying glaze.

When the metallic mixtures are introduced into the glaze (formulas 1a to 6a) the firing is carried first to the point of fusion of the glaze, cone 09, but the reduction is made in the same manner as in the first case. The muffle is left to cool down to red glow, about 500° C., then the reduced firing is given, care being taken to keep the temperature as uniform as possible all the time.

Old potters had realized how important it is to have an even distribution of the reducing gases, and as they could not obtain such regularity in their primitive kilns, they had made a kind of inside muffle or cylindrical box in refractory clay, the sides of which were pierced with many holes. This was enclosed in brick masonry built around it at a distance of about fifteen centim., so that the reducing gases emanating from the fire mouth at the bottom might penetrate into the box through the holes. Piccolpasso has given in his manuscript many figures illustrating the details of this contrivance, and Passeri gives us a rather thorough description of the firing.

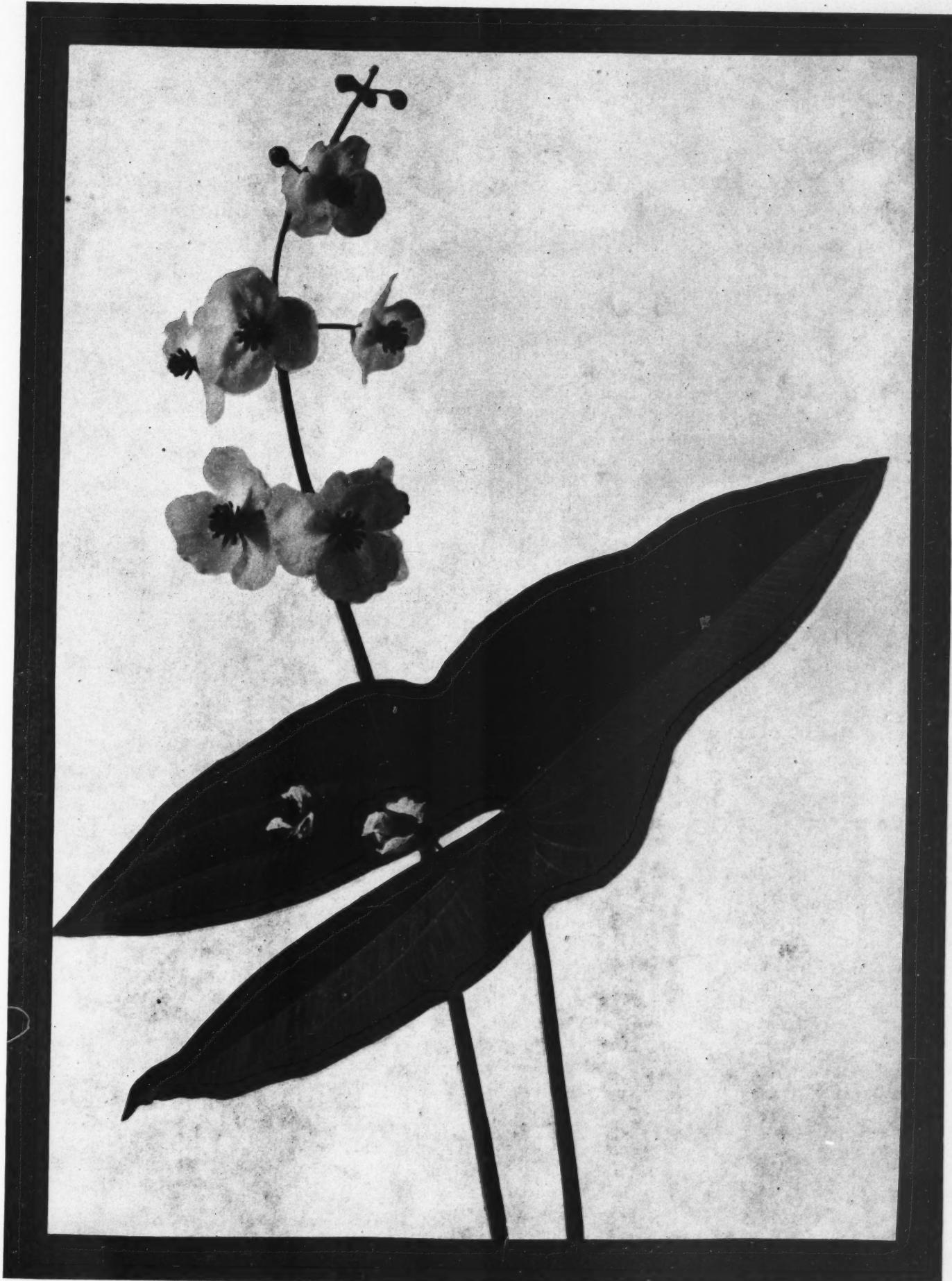
" . . . the vases, after being drawn from the kiln (meaning the second or glaze firing) were touched with the red color and fired for the third time in a muffle kiln. A 'cestone' or large vase in the shape of a basin pierced all over with holes, and filled with vases colored with the red, was placed in the kiln. The firing lasted six hours, not more, and was done with broom wood."

This tradition has been preserved to our day and modern potters use the inside muffle described by Piccolpasso, also use broom for fuel. I have proved before<sup>2</sup> that metallic deposits can be obtained in any kind of a muffle and with any kind of fuel. I have used in my experiments an ordinary muffle with a damper at the base of the chimney, and in order to have the muffle hermetically closed, I had this damper made of cast iron and sliding closely into iron grooves. When it is closed, the gases coming from the fire mouth pass between the brick sides and the muffle proper, penetrate, through the evaporation hole of the vault, into the firing chamber, then go out through the spy hole, which is left open, except when the reduction is made with gas or sugar compounds.

The Italians, from information which Passeri borrowed

1. There are at the entrance of the Villa des Dunes, at Cannes, on the Mediterranean shore, twelve jardinières in red glaze of chrome, which bore no trace of iridescence when they were placed there, about 1890. They are to-day as iridescent as if they had been submitted to the action of reducing gases. They were made by a pottery which never manufactured iridescent ware.

2. L. Franchet—*Les lustres à reflets métalliques*, Paris, 1896.



SAGITTARIA—PHOTOGRAPH BY HELEN PATTEE

(Treatment page 296)

from Piccolpasso, also used for the smoking process broom wood, the green branches of which burn with much smoke. Martinez de Frugo's manuscript does not mention the fuel used by the Moors, but we find this information in the accounts of the Duke of Berry's tile manufacture in Poitiers, for which, as I said before, he had hired the services of a Moorish potter "Jehan de Valence, ovrer de carreaux", who ordered to be brought from Mintré "des fagots de genet" (sticks of broom wood). These accounts have been published by Mr. Magne.

I have given much attention to this question of broom for fuel, as it was evidently considered by the old potters as absolutely necessary for the development of metallic deposits. I have tried a number of organic matters and have found that results were identical to those obtained with broom. Coal however has the great disadvantage of increasing the heat too much, a thing which it is important to avoid in this work. Ordinary green wood burns irregularly and the formation of gases is at times slow, at other times intense. Tar, petroleum, resins and oils are very good, because they give an abundant smoke without raising the temperature in any noticeable way. Pieces of wood, paper or rags may be saturated with tar or oils and thrown into the fire mouth which is still hot enough to develop a strong formation of hydrocarbons, without generating flames.

However the best process consists in the use of ordinary illuminating gas, but the reduction then is so intense that the operation must be watched with great care. The muffle I use in this case has its sides pierced with four holes (two on the left side and two on the right), having twenty millimeters in diameter and placed three centimeters above the muffle bottom. With a large muffle kiln, the number of holes should be increased to six, eight or ten. These holes are closed with clay during the first part of the firing to cone 09. Close to the outside walls of the kiln runs a gas pipe, supplied with as many valves as there are holes in the kiln walls. When the time has come to reduce, small iron pipes, attached to the valves with rubber tubes, are introduced into the holes so that they will protrude inside the muffle to a distance of about two centimeters from the inside wall. After the tubes have been introduced, the holes must again be carefully closed with clay, to avoid a gas explosion which might be produced by the mixture of air and gas, or the combustion of the gas. Generally there will be some flame produced at first, because of the air in the muffle, but as soon as the oxygen is absorbed, the combustion stops.

Six cubic meters of gas per hour should be used for a muffle having one cubic meter capacity.

The time of reduction is of great importance, since the color of the metallic deposits depends upon it entirely. We have seen that silver mixtures will, according to the time of reduction, pass from brass yellow to brown, then to black. Passeri says that the third firing lasted six hours, not more, but this evidently included the firing proper, which takes about three hours, so that the reduction must have lasted about the same time.

I have obtained metallic deposits as brilliant and clear as the old ones, with the use of coal, tar, petroleum, oils and resins, and I have brought down to two hours the time of reduction, but this operation was conducted with great regularity and there was no stop in the formation of hydrocarbons. With vegetable fuel, three hours at least are necessary. I have kept the reduction during five, eight and ten hours; the metallic deposits have become very dark, but

not black, as happens with illuminating gas, when the reduction lasts only 35 to 40 minutes.

It is very difficult to study the different stages through which metallic deposits pass, when an ordinary fuel is used, on account of the length of time, but with gas the reduction is over in ten minutes and must not exceed thirty minutes, as above this limit the metallic effects and iridescence disappear.

There is still another way to obtain the deposits. It is the introduction into the muffle, at the time of reduction, of some sugar compound. This is done through an opening either in the walls or the vault. The temperature of the muffle is high enough to allow an abundant formation of gases, without burning the sugar too rapidly. The operation must last at least two hours. This method is very simple, but the results are uncertain.

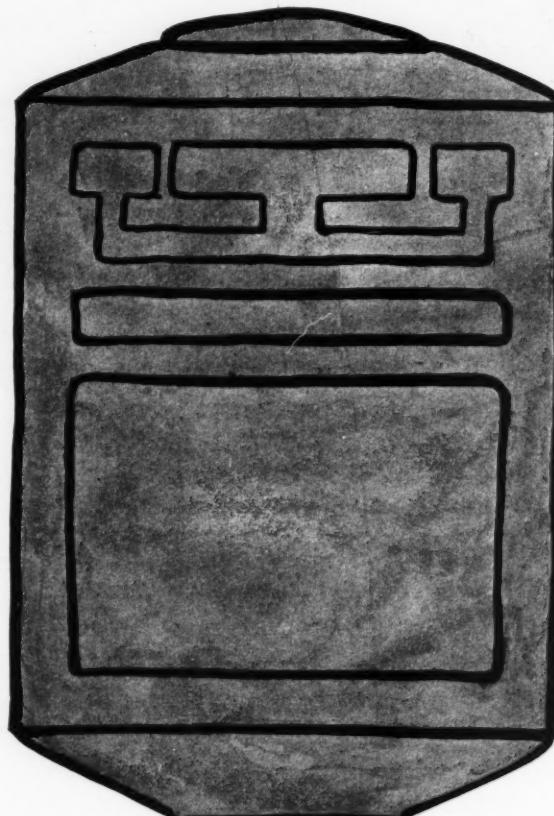
To sum up, the best and most practical reduction is obtained with illuminating gas.

#### APPEARANCE OF GLAZES AFTER REDUCTION.

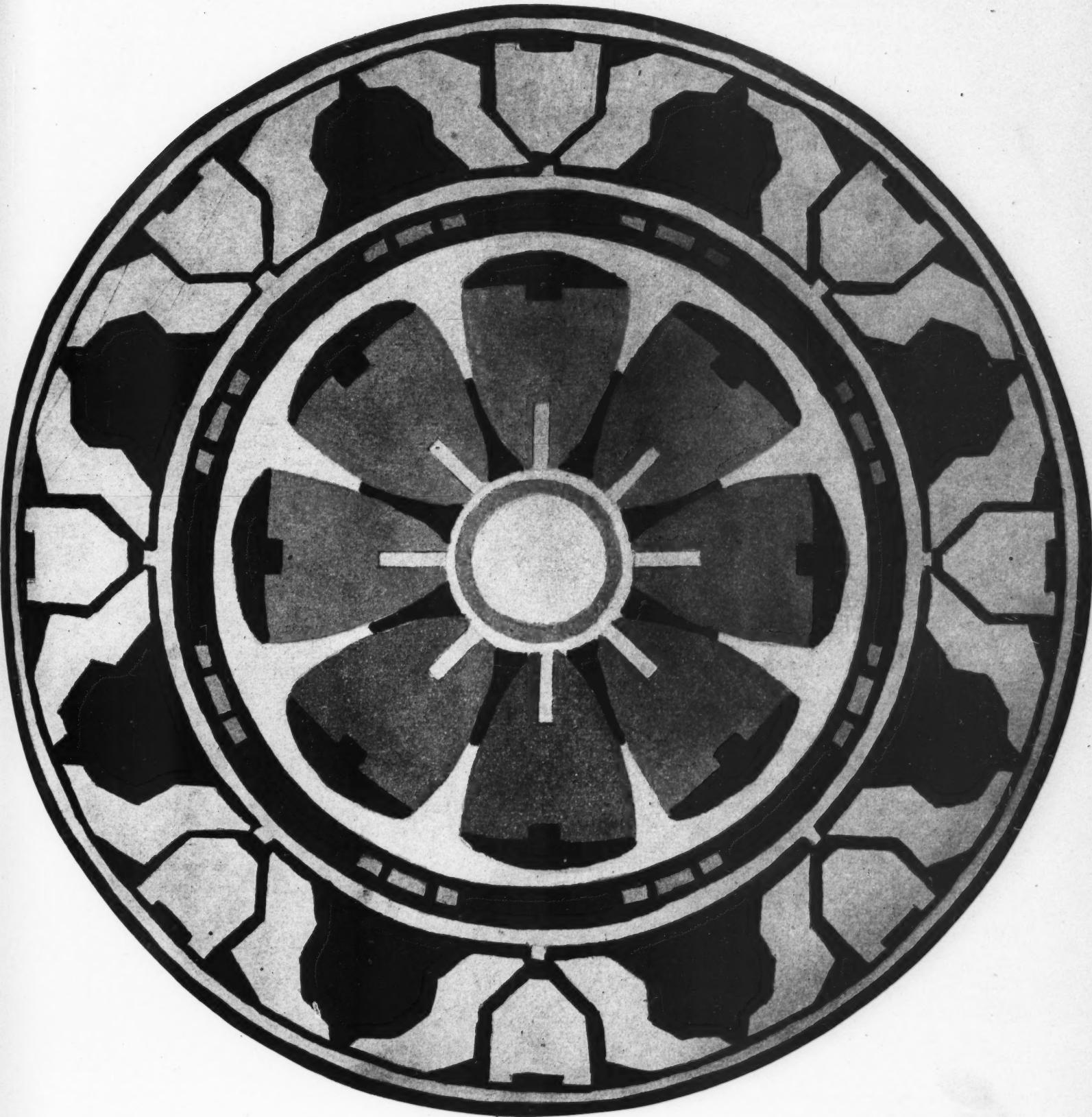
The iridescent glaze formulas 1a to 6a come out of the muffle after reduction with brilliant iridescence and do not need any polishing. It is not so with deposits formed over the glaze (formulas 1 to 6). These do not exactly need to be polished, but they are covered with the ochre mixture which has helped their formation and which is more or less adherent according to the more or less intense firing. This covering is easily removed with a wet cloth, and, if necessary, some finely ground sand. The metallic iridescence then appears in all its brilliance.

This ochre residue coming from the scrubbing of the ware, is rich in copper, silver or bismuth oxides, and was, as we have seen, called by the Moors "scoria" and was used to be added to the next metallic mixture.

(TO BE CONTINUED)



TEAPOT—INA C. BRITTON  
Incised and glazed in soft green.

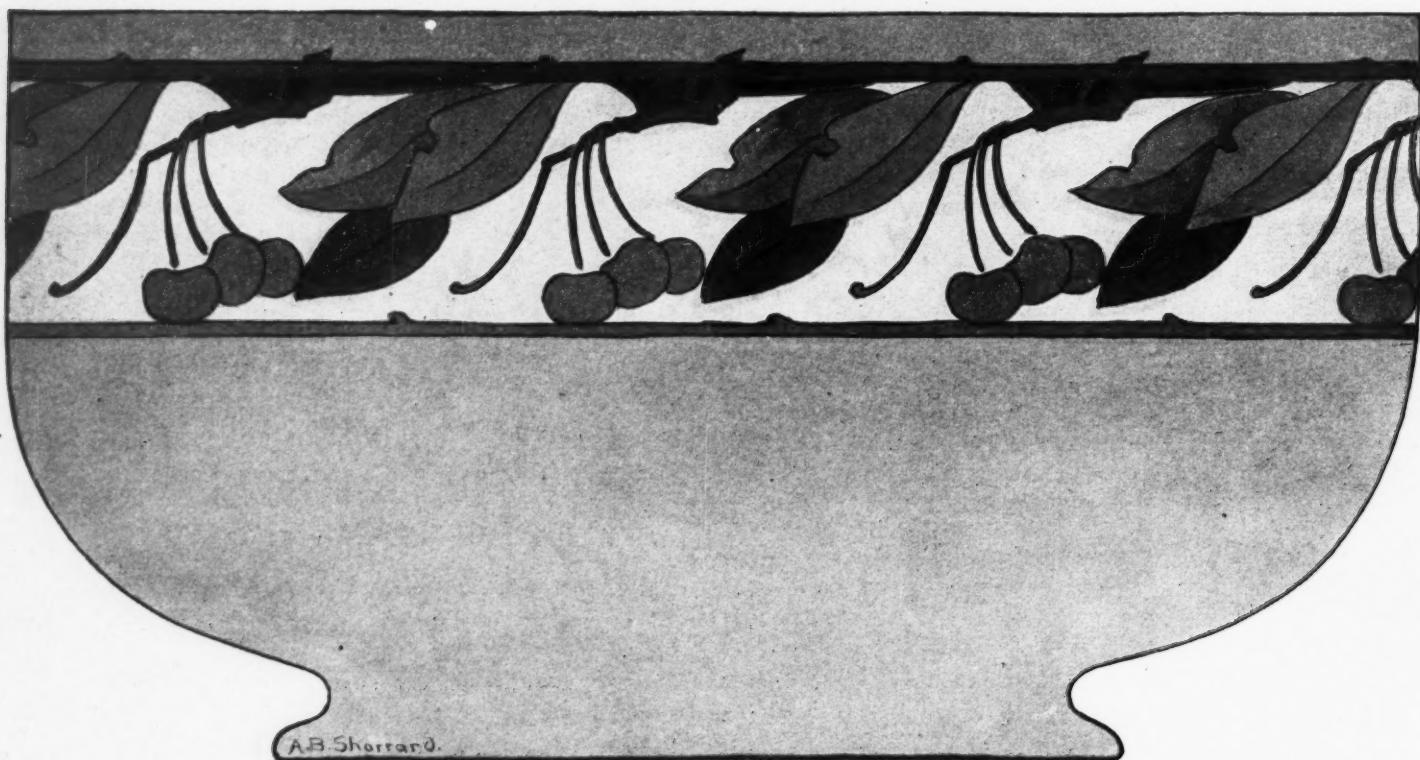


TULIP PLAQUE—B. H. P.\*

No. 1—Deep Ivory tone all over for first fire. Put a touch of Black in the tint. Execute the design in two tones of dull Peacock Blue (Blue Green with a touch of Black and Royal Green.)

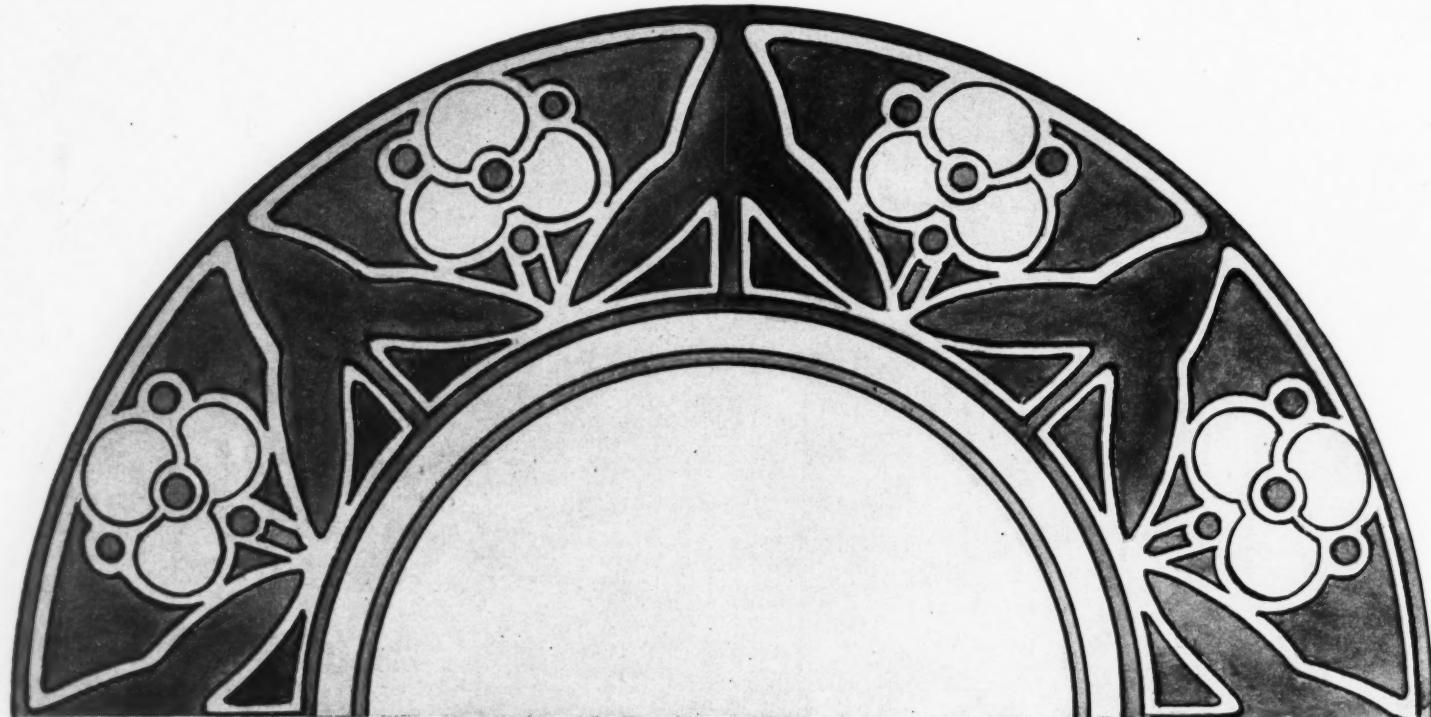
No. 2—Deep coffee tint (Yellow Brown with a touch of Black) Design in same Peacock Blue as scheme No. 1.

\*This design was sent in competition signed with initials B. H. P., but the name of designer has been lost.



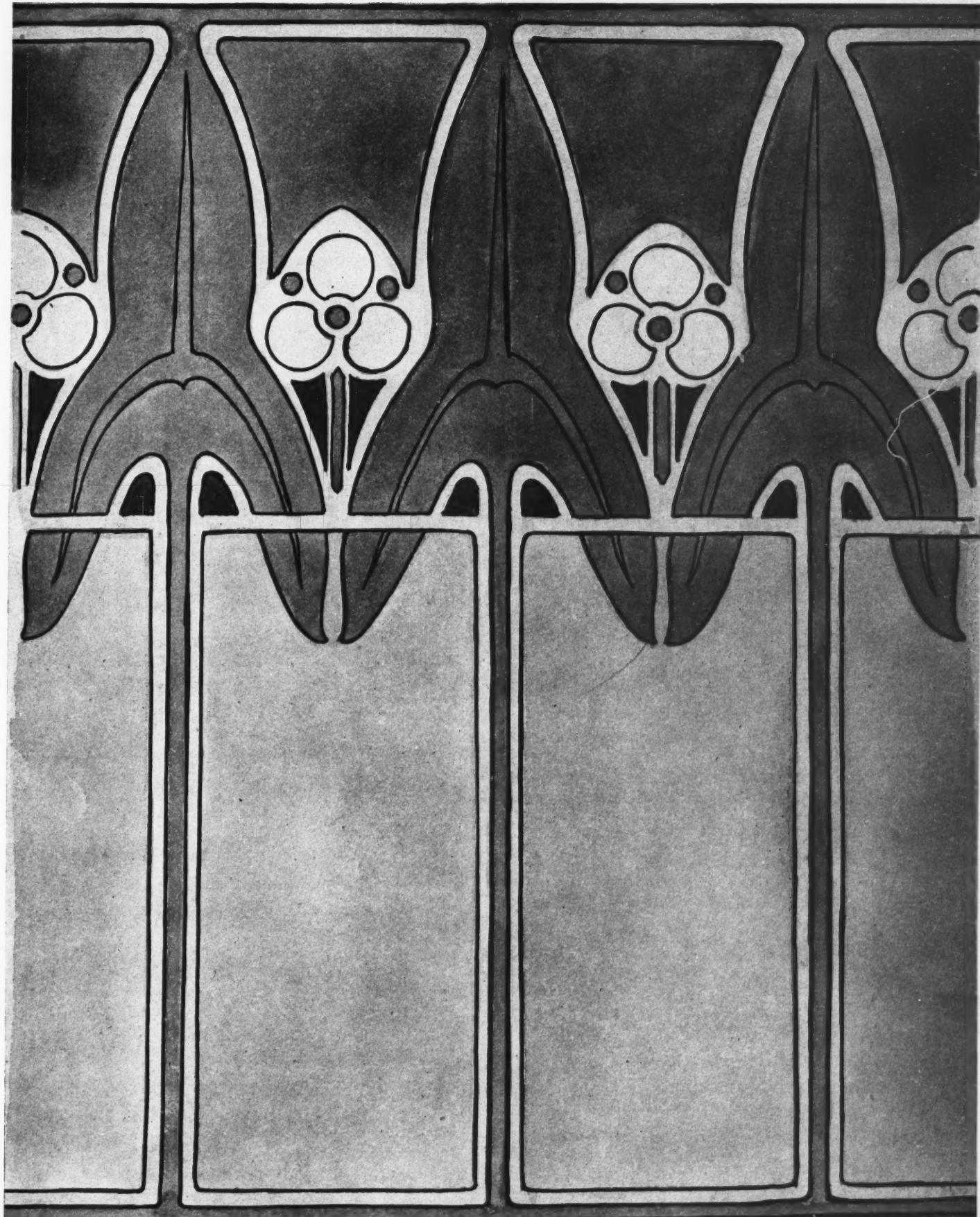
CHERRY BOWL—ALICE B. SHARRARD

The Bowl should be a soft grey outside, with a lining of orange or yellow lustre. The ground of the border, cream with design in grey green and soft browns with gold or red outlines. Cherries should be shades of yellowish brown.



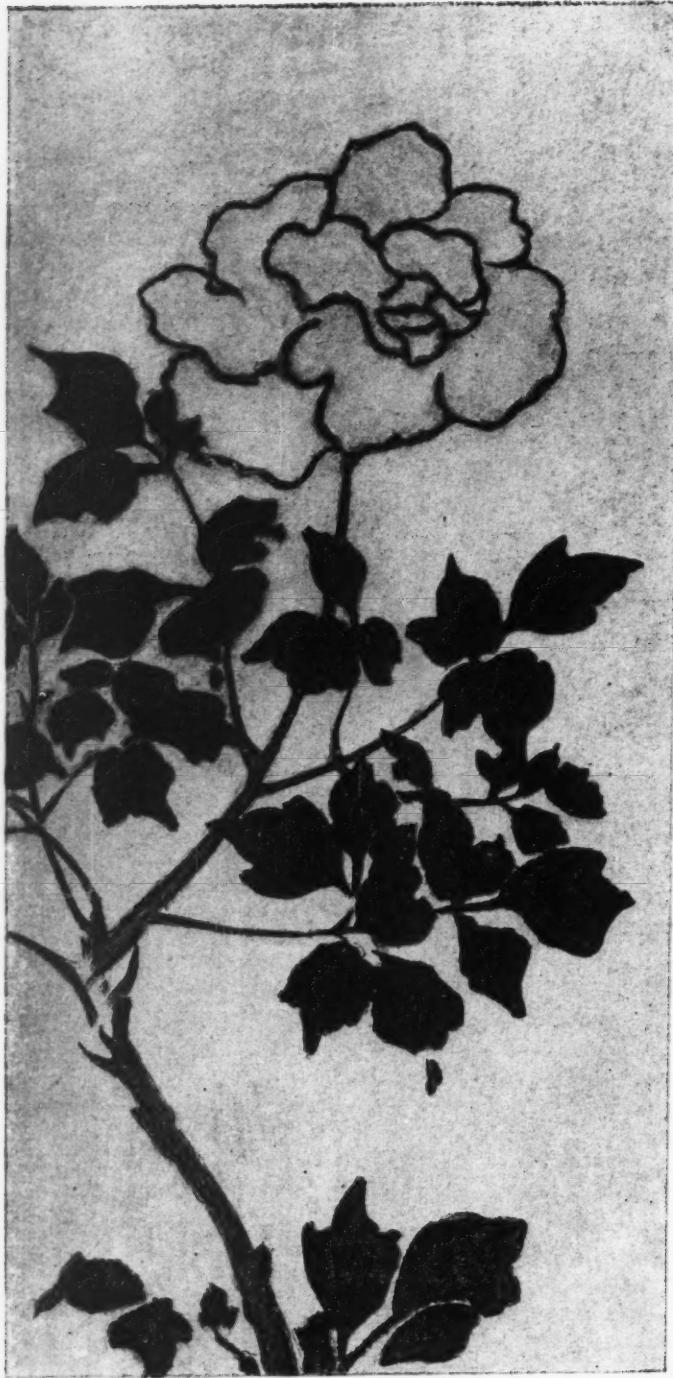
SAGITTARIA DESIGN FOR PLATE—H. BARCLAY PAIST

Ivory tint over all, leaving flowers white; Grey Green background, Yellow Brown stamens and pistils; outline of purplish brown or gold.



SAGITTARIA (ARROWHEAD) DESIGN FOR STEIN—H. B. PAIST

Dull yellowish olive over all, Neutral Yellow or Yellow Brown with a touch of green and black; design dull olive, with a touch of Black, light panel back of flower a lighter tone of olive; dark panels dull brown, Violet of Iron with Yellow Brown; flowers, pale Violet of Iron; outline Violet of Iron.



A study taken from a publication called "The Kokka" found in the Metropolitan Museum of Art

#### DESIGN FOR THE DECORATION OF CHINA

*Caroline Hofman*

SECOND PAPER—Continued

Now without following any of these designs, but simply by remembering our principles and putting ourselves into the spirit of the work, let us see what we can do that is wholly our own.

Try again and again, with ink and a brush, touching your designs in freely on a big sheet of paper until you have a dozen or more, and keep your whole attention fixed on the effort to follow principles and to produce a beautiful result.

Something which I feel will be of help to you in making designs from flowers motive is to notice the strong contrast which nature usually, not always, shows between the

shapes of the flower and the leaf belonging to the same plant. Take any familiar flower,—rose, lily, violet,—they are all examples of this peculiarity which is such an advantage in a decorative way, giving us an opportunity for the contrast which is one of the important elements of decoration.

Often a beginner in design, in dealing with small forms, will unconsciously allow his leaves and flowers, or his leaves and the petals of his flowers, to take on much the same shape and appearance, thus making the design very monotonous.

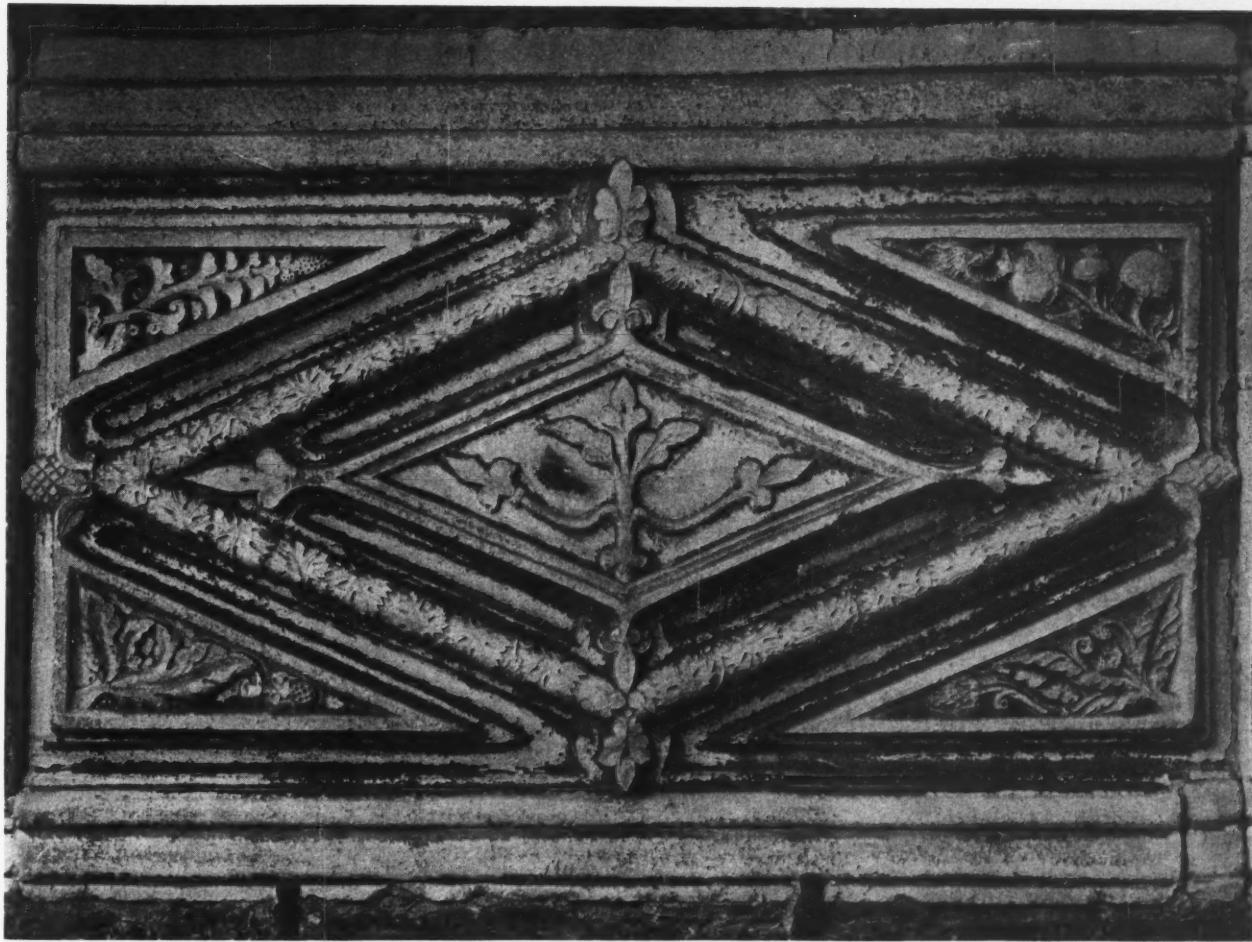
Of course in designing we sometimes need the repetition of the same form, or similar form, in leaf and blossom, and nature is not without authority for this, but a designer must use them with purpose and intention, and not through lack of care. Often we can reach good decorative results by exaggerating, somewhat, the relative sizes of flower and leaf, where the design is quite an abstract one. It gives an opportunity for subordination of sizes which we can all study out for ourselves.

In trying to simplify flower-forms you will find certain Japanese books which can be had for very little money that are filled with suggestions.

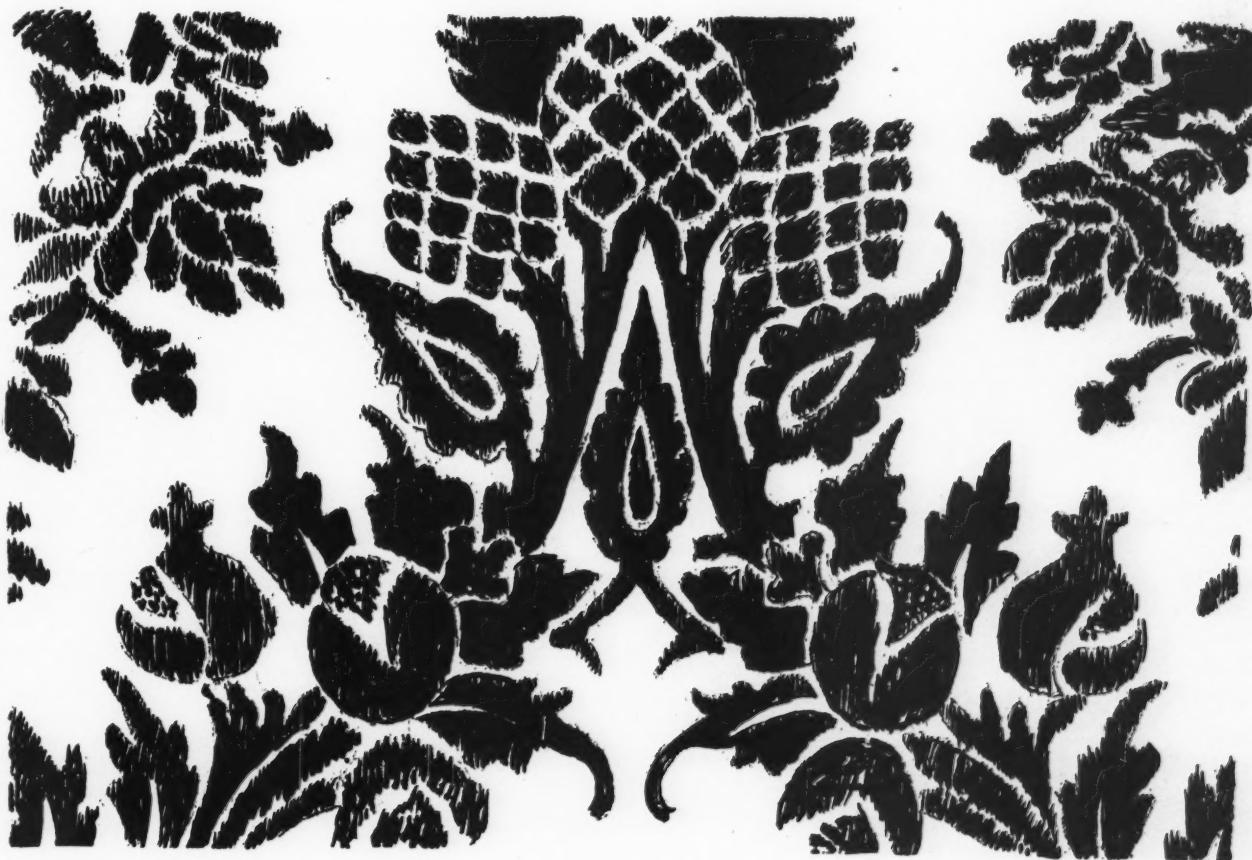
Taking for granted that by this time we have at least a dozen little designs before us, rather roughly spotted in, from which to choose, let us decide which are the best, and then try still farther to improve them. Pin a piece of tracing-paper firmly down over the selected units, and still using brush and ink, see what you can do to improve them



From an Old Textile



Byzantine Ornament



From an Early Florentine Textile

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farther. Sometimes a very slight change of spacing in a small design will so alter it that it is like a new pattern.

Since we are spending this time in study we can afford to work over our designs, to trace and retrace them until the shapes and the spaces are what we want, for all this is training in appreciation. Do not rest until you have made a beautiful little seal, which you can use on a bit of china, and can feel is quite your own; one that you know has some solid merit, and is the very best that you can do. And you must use it in one of the ways that have been suggested. Have the object it is intended to ornament before you when you plan the seal, so that you can plan it with direct relation to that object. If you want to use it to decorate the cover of a small box you must consider just where the seal will be most effective; and you may have to plan some nicely spaced lines around the edge of the cover in order to make the whole composition a good one. Do not try

to use more than one color in the seal, as it would not lend itself to anything but the simplest treatment.

There have been periods when the designers of textiles put into their work the very qualities that at the present day we are seeking for our ceramic patterns; that is, abstract design, yet with the fine graceful movement that nature gives us in her line construction. Two of the illustrations of this article show textile designs of early date which are excellent studies in line movement as well as in space-division; and abstract as they both are in treatment you cannot imagine their having been designed by persons who have not studied nature carefully, and thoroughly learned to appreciate her forms.

We, too, can learn to express fine *pattern* in our floral designs, with dark and light effects that have a purpose and meaning. Then we shall use our flowers in good decoration, free and graceful in curve and strong in construction.



PLATE—C. BABCOCK

Pale cream color (Ivory Glaze with a little Yellow Brown). Two tones green, outlines gold or Deep Green.



THORN APPLE—M. E. HULBERT

(Treatment page 286)



TULIP STUDY

Nancy Beyer

**F**IRST fire—Background, Pearl Grey; leaves, Apple Green and Grey Green in shadows only, leaving the china white on the high lights, deepening the color in shadows with Gold Grey and a very little Ruby for the darkest touches, put in the shadows of the flowers in the sketchy

way, shadows Air Blue and very little Brown Green, warm the petals with very little Rose or Peach Blossom used very thinly leaving the china for high lights. Stamens, Apple Green tone with a very little Yellow Brown, with touches of the same on the stems.

Second fire—Tone the whole thing with Pearl Grey and very little Gold Grey, just a touch, wiping out the pinks and when the color has fired out use the same colors used before, use Shading Green where necessary, fire.

Third fire—Deepen colors where they have fired out, soften and draw them together where necessary, adding the darker touches.

This tulip study could be applied to a panel and the soft grey background shading gradually from top to bottom. The treatment I have here given is for a decorative study of the tulips, as the tulips suggest that, in the way in which they have been treated in the pen and ink.

#### \* \* \* TREATMENT FOR BOWL

*Mrs. A. L. B. Cheney.*

**A**FTER dividing the bowl, trace the design and outline in Japanese ink. If the bottle ink is used, it may fire in when the color is dusted over it. Place medallion at three points on outside of bowl, trace and outline. Apply special oil and, after a few moments, pad evenly. When thoroughly dry, dust with equal parts Ivory glaze and Grey Green. Clean out the design and fire.

Second fire: Apply special oil on spaces representing the design, pad and dust with 4 parts Empire Green, 1 part Brown Green; clean out the background. Medallions on outside treated in same way. For lines enclosing center figure, for bottom of bowl inside, use same combination of Brown-Green and Empire-Green.

#### \* \* \* STUDIO NOTES

Mrs. A. L. B. Cheney has removed her studio from 106 Broadway to 82 Broadway, Detroit, Mich. She will hold in her studio during the Holy Week an exhibition and tea, the exhibition including a large variety of craft work.

Mrs. Henrietta Barclay Paist of Minneapolis, has moved her studio to her former home, 2298 Commonwealth Avenue, St. Anthony Park, St. Paul Minn.

#### \* \* \* SUPPLEMENT AND VASE—CALLA LILY

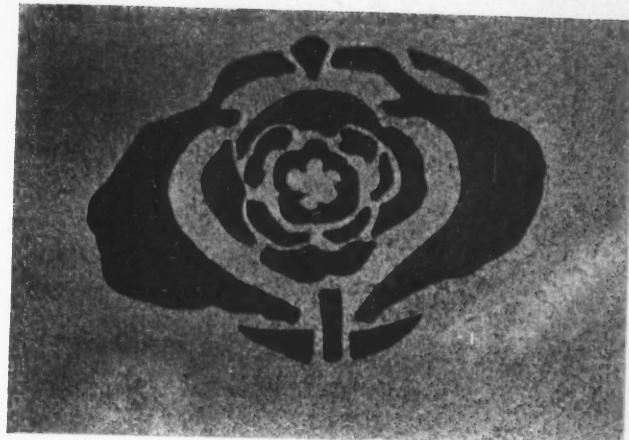
*Ophelia Foley.*

**T**INT with Albert Yellow; clean out lily; paint leaves and stems with Grey Green, Albert Yellow with Yellow Brown on tips of lilies; outlines in Grey Green with a touch of Black. After firing, tint all over with Pearl Grey. Clean out the lily, slightly shading with Pearl Grey and fire. Strengthen color if necessary in third fire.

#### \* \* \* THORN APPLE (Page 285)

*Maud E. Hulbert*

**T**HE petals of the blossoms may be shaded with Warm Grey and Brown Green (or Grey for Flowers.) Use a little Silver Yellow in the centers and Apple Green and Brown Green for the little new leaves. The stem may be painted with Finishing Brown, Deep Blue Green and Yellow Ochre and the ground with Copenhagen Grey and Blue. Very light washes of Deep Blue Green over the petals in some places add to the effect of whiteness and over others use a wash of Ivory Glaze.



MEDALLION FOR OUTSIDE DESIGN OF BOWL—L. B. CHENEY.



BOWL—L. B. CHENEY



## HAPPY STUDY HOURS\*

IN the beginning let me tell you that I know all about the struggle of the china decorator in a small town,—the discouragement that comes from the lack of opportunity to study with one's "ideal" teacher, the necessity of doing pot-boilers all the while, that the purse may not be quite empty from the demands upon it, and the contending against the unsympathetic attitude toward one's work of other members of the family. I've *sent* china to be fired and wept at the disappointing results. I've carried home china to be fired after a long day's teaching and ached and wept again from fatigue and worry. Will you then believe that I want to help all you workers who feel far away and out of it? Will you feel free to write of your vexing problems, whether they be of a purely technical nature or the sometimes delicate matter of arranging and managing classes large or small in or out of your own studio?

I realize that many workers and teachers honestly think they haven't time or money with which to study. But study doesn't necessarily mean going to the city to work in some private studio or school. It may mean just looking with loving interest and thought at what nature has surrounded you with. Do more than look at it, work *with* it. I never feel that I'm working alone and without help when I'm drawing a lovely flower or fruit growth. There is something about the very life of it that seems to give new strength with which to work, while the beauty of it rests and soothes one.

Don't feel unhappy if your first drawing isn't "pretty." If you've drawn the "facts" of the growth, your mind and your folio are enriched for all time. You don't know where or when you may use the drawing, but believe me, it will be well worth treasuring, and even if you should lose it, you'll have it always in your mind. When I was living as perhaps you are and didn't know much about drawing pencils or water colors, I drew and painted a clover. It didn't make a "hit" with the family, but this was one of my first brain children and I protected it as one does an ugly unfortunate little thing, and brought it with me to the city. It was six years before I again had an opportunity to paint a clover from nature. In all that time I scarcely saw one, but I used it successfully as a decoration many times in those years, because I had the picture in my mind, and the facts on paper, and my despised little old study probably has helped to pay many months' rent. Aside from the joy of drawing a thing while the life is in it, believe me it *pays*.

But we all would do so much more studying, we think, if we only had time. At this studio we are gaining time. Let me tell you how. We were all much impressed by a story, in one of the Christmas magazines, which described a little boy whose father on the eve of his departure for a

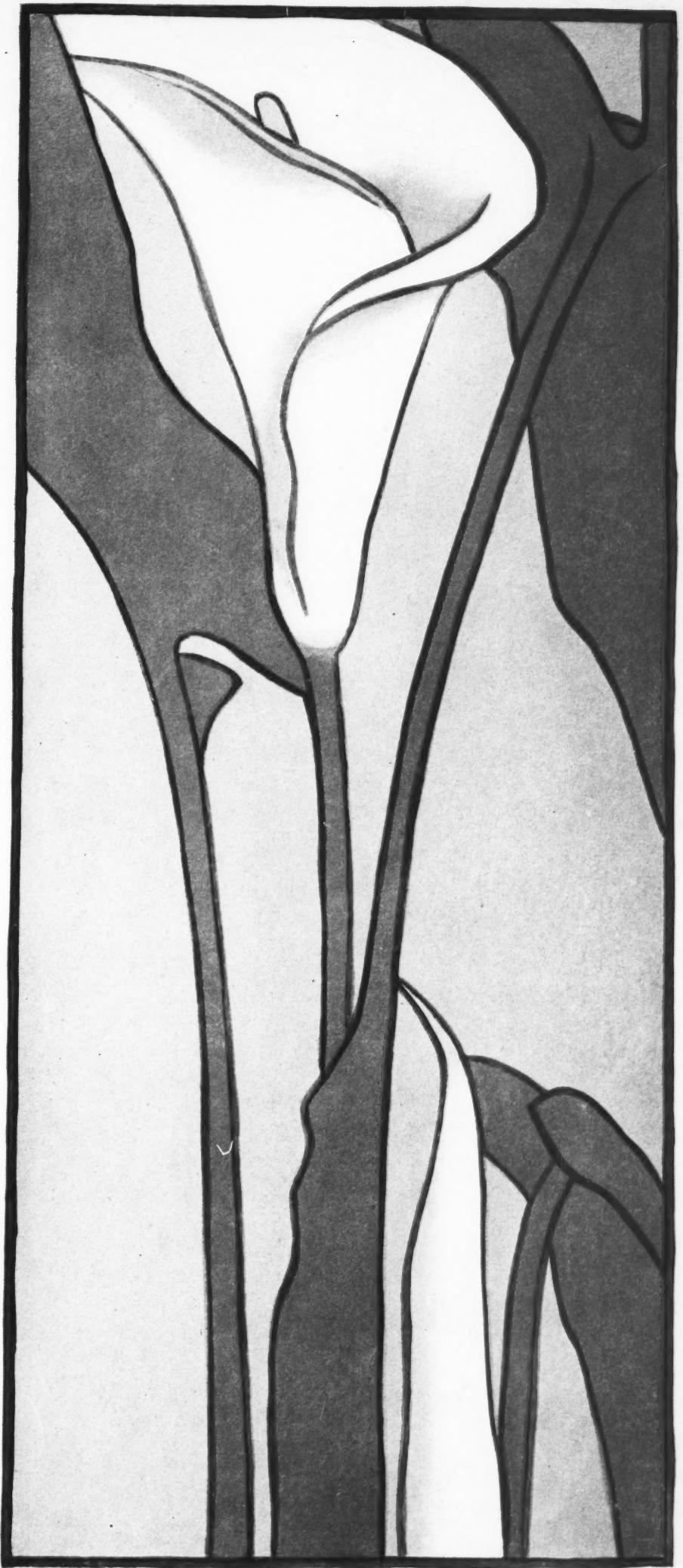
long stay abroad, gave his son in parting a "Happy Day." On that day the dear old lady in whose care he was left, was to dress him in white and put bright pennies in his pockets and he was to be free from work or care and just be happy, and all his life he was to keep that day *white*. We all wondered how it would seem to have a whole day a week on which we were not to work or worry, but to play with the things we'd be happy with. We thought it over, found we were "grown ups," needing bright dollars instead of pennies, but we decided to try happy *hours*. It has worked. It is a badly paying profession indeed, or a good profession badly managed, that will not admit of one hour a week off. Even in that time you'll be surprised at what you can do. Save it for what you want to do most.

A little drawing, perhaps the carrying out of some nice design you think won't sell, but will satisfy your hunger for something quiet and better. Even if you only do one piece a year, do it! Each quiet, thoughtful happy hour of chosen work will bring you rest, courage and a better understanding and appreciation of all the ideas developed by your fellow workers in the craft. I've tried all the things I am suggesting. In that other more quiet life I didn't name my study days and hours. I know now, though, that they were happy ones and feel that some of



the impatience and discontent might have been curbed had I been told of a happy way out. Of course one's studio day seems to have no end, but I decide now that it shall have, and at the close take my happy hour. It may seem that I accomplish very little, I may have nothing to show, for perhaps I have talked my hour out to a girl who *must* make money and while a splendid student, liking to develop and apply only the best in quiet conventional designs, she cannot always satisfy her patrons with this work entirely or in the necessarily higher price for it. One hardly dares breathe the word naturalistic, but after looking through some fine old Japanese prints and books we decided that all naturalistic work is not necessarily bad, any more than all conventional design is necessarily good. So we planned



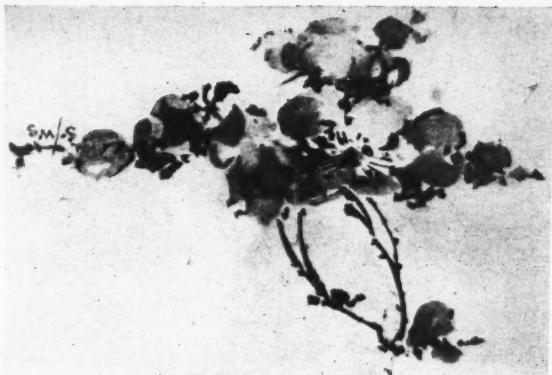


CALLA LILY—OPHELIA FOLEY

APRIL 1908  
SUPPLEMENT TO  
KERAMIC STUDIO

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SYRACUSE, N. Y.





something that we thought could honestly be called the decorative arrangement of a natural growth. The girl used all her knowledge and feeling of spotting and spacing in applying the drawing and was happy with her problem. As a result she "held up" her customers.

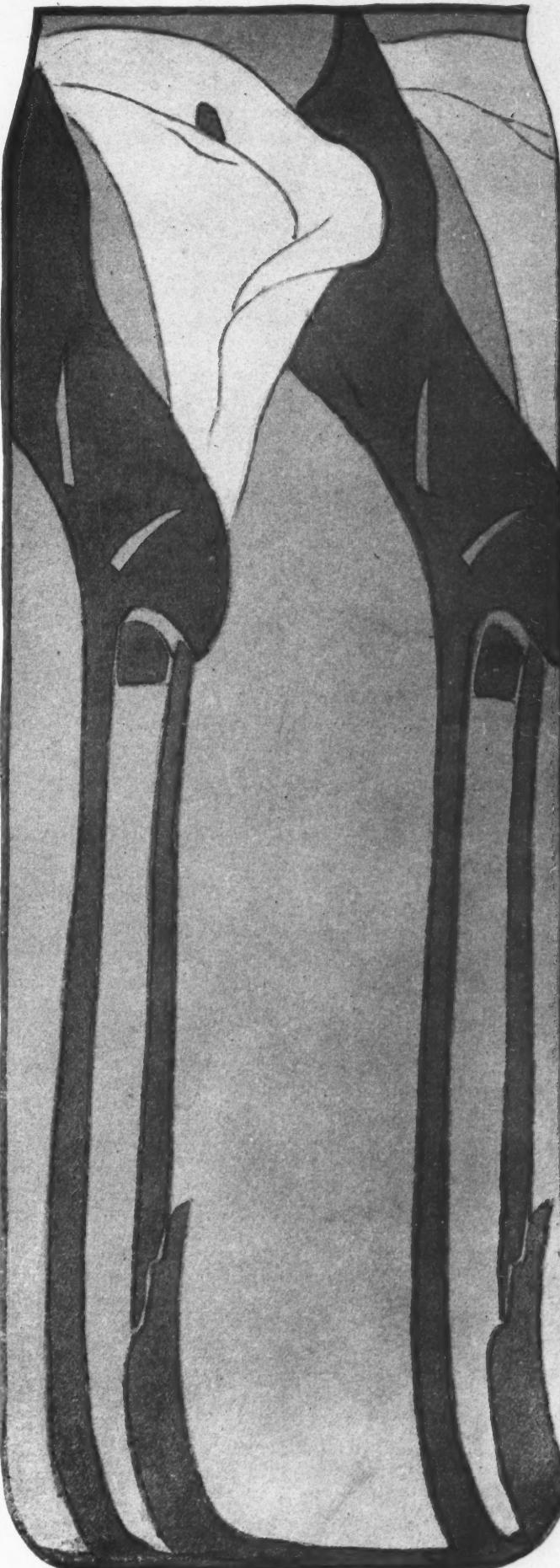
Here is the idea and if you are getting ready for an Easter sale it may have come just in time. Tint a perfectly plain shallow cup and saucer with yellow lustre, being careful to pounce it until firm, then tint the under side of the saucer and inside of the cup with orange lustre pouncing until light and even in tone. Before applying any lustre you will of course wipe over a surface with lavender oil, and where the lustre to be pounced is a thick sticky one, such as orange or yellow brown, leave the surface quite moist with lavender oil and work the lustre in it. The color will then hold open long enough to enable one to produce, with the pounce, a firm even tint.

A soft yellow single rose was chosen as the decoration to be applied upon the fired lustre background. The drawing was kept in harmony with the lines of the cup and saucer, and the colors were laid quite flatly, toning with the delicate yellow and orange. In a second working a thin tint of yellow lustre was washed over the orange lustre, softening and mellowing all together. The rose growth was sketched as crisply as possible that very little if any touching up was needed. There is always so much danger of working the life out of a flower, leaving it a stupid uninteresting decoration. Both cup and saucer were rimmed with gold and the handle was made solid gold.

The first one was so popular that the girl did six more and a sugar and creamer to match. I suggested an oval brass tray for them all and the result was a lovely bright harmonious set. They didn't pretend to be so awfully serious, but they were honest sunny little cups with a perfectly lawful decoration.

It has taken a whole bunch of my happy hours to write all this, and won't you let me know if you think I can help you a bit?

*The Happy Worker.*



CALLA LILY DESIGN FOR VASE—OPHELIA FOLEY  
Same color scheme as supplement.

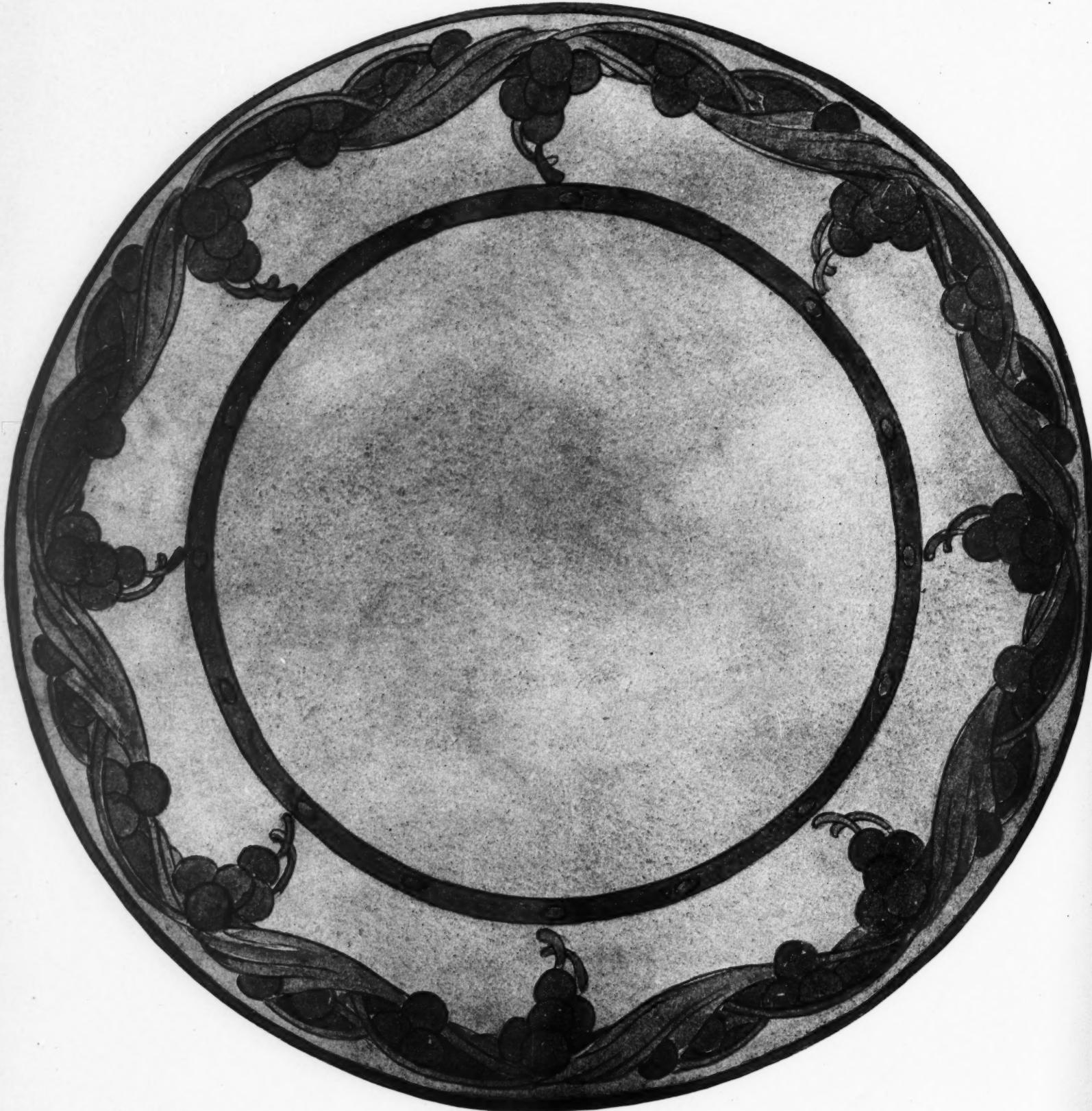
## KERAMIC STUDIO

## COWSLIPS

*Maud E. Hulbert*

THE petals of the cowslip are a very glossy and brilliant Yellow, use Silver and Orange Yellows or Lemon and Albert Yellows, with deeper yellow centers for which use the same yellows and some Yellow Ochre. The stems are a

light green and show that the cowslips grow in damp places for they look as though they held the water. The leaves are glossy and dark but are much lighter and greyer on the underside. Use Yellow, Moss and Deep Blue Greens, Brown Green and Shading Green; Chocolate and Chestnut Browns with Ochre and Warm Grey might be used for the ground.



PLATE—DOROTHEA WARREN

COLOR scheme—Grey tone over all. Bands and outlines, Copenhagen Blue. Leaves and stems, Apple Green thin. Berries and spots in band, Orange or Albert Yellow toned

with Yellow Brown. A touch of Violet may be added to the Copenhagen Blue if desired, and a touch of Royal Green added to the Apple Green.



COWSLIPS—MAUD E. HULBERT

# THE CRAFTS

Under the management of Miss Emily Peacock, 232 East 27th Street, New York. All inquiries in regard to the various Crafts are to be sent to the above address, but will be answered in the magazine under this head.

All questions must be received before the 10th day of month preceding issue, and will be answered under "Answers to Inquiries" only. Please do not send stamped envelope for reply. The editors will answer questions only in these columns.



Metal Box with wood lining. Courtesy of International Studio

## THE MAKING OF A METAL BOX

Edmund B. Rolfe.

THE first box to be described, is, in fact, a wooden one, covered with thin metal inside and out. The wooden frame gives the necessary strength and allows the use of hinges and a lock that can be procured at most hardware stores. It allows, too, a different treatment of the metal than can be obtained from the handling of heavier metals, and this treatment should be taken advantage of when the design is first thought out. The rectangular box illustrated shows one way of using this method.

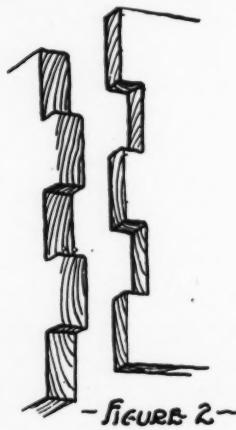
Having procured a piece of good, tough, well seasoned wood, preferably mahogany, of 1-4 or 5-16 of an inch in thickness, depending on the thickness of your lock and width of your hinges, draw an outline of what is to be the front piece of the body of the box, repeating same dimensions for the rear piece. The two end pieces should be laid out the full width of the body as the corners will fit into each other and will require no allowance made for the thickness of the front and rear pieces.

Mark on each end of each piece, a line, the thickness of the wood, removed from the edge. Divide it in five equal parts and extend lines from these points to the edge.

Metal workers probably will not have the tools used by cabinet makers but some of the metal working tools can be used making the wood lining and they will be mentioned in their proper places. For the work just given the metal piercing saw (FIG. 1) can be used.

Remove alternate sections from the ends to allow of

them fitting into each other (FIG. 2). If you saw a little outside of your lines, a common flat file will be useful to give them a snug fit. Assemble the sides on a piece of the wood and when the corners are at right angles draw a line about the lower edges to mark the dimensions of the bottom. Saw this out and bevel each edge; similarly the lower edge of each of the sides. This will allow of the bottom being let into them. (FIG. 3) The cover is made in practically the same manner as the body, except that the sides will require but one section removed from the ends (FIG. 4). At this time saw out the places for the lock and hinges. (FIGS. 5 and 6).



-FIGURE 3-

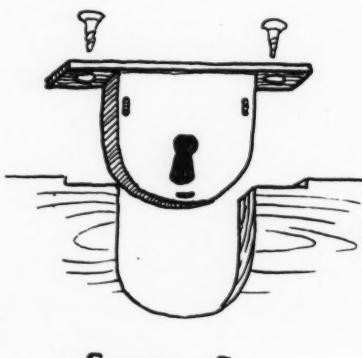
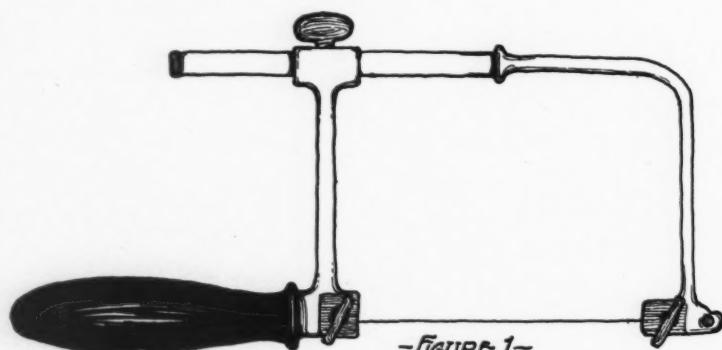
When all joints fit perfectly, glue them in position and securely tie or clamp together. Leave till next day when the glue will be thoroughly set.

When it is ready for further work, go over it with emery paper and files and see that it has a good even surface. Round each edge slightly and the metal will have no sharp edges when the finished box is handled.

A hexagonal box, as Mr. Cooper's, here illustrated, would require slightly different treatment. The sides are cut of the same size and their edges bevelled with a small shooting plane. The top of the cover is made of one piece and the plane used

to give it the proper shape. The rim of the cover is cut and glued on, the sides and bottom bevelled and all glued together.

To cover the rectangular box with metal select a piece of No. 30 gauge soft copper that has a pleasing texture. It can often be procured with a fibrous surface, caused by impurities in the metal when rolled. The purer grades come with a smooth surface which is very uninteresting. They can be improved by hammering the metal on a piece of smooth flagstone, with a round headed hammer, first covering the metal with a piece of sheet lead about  $\frac{1}{8}$  inch



-FIGURE 5-



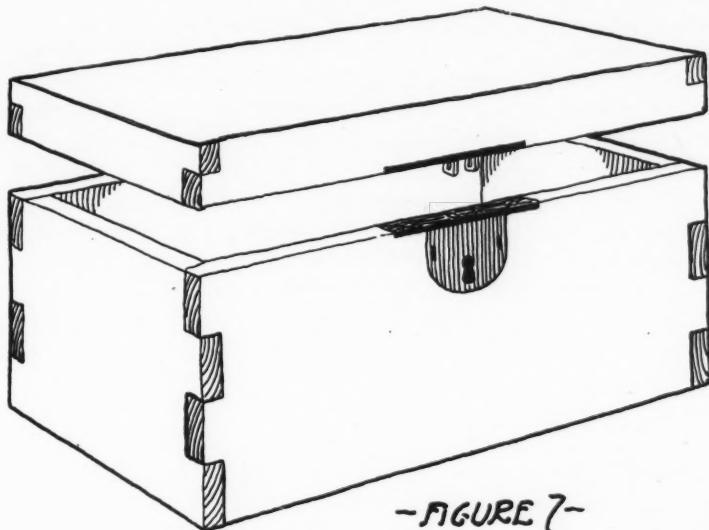
-FIGURE 6-



-FIGURE 7-

in thickness. The texture of the stone reproduces itself on the metal providing it is thin soft sheet. The heavier metals do not lend themselves to this process. Sometimes pieces of cast iron, have a texture that will look well on copper when worked in this way.

A little experimenting will probably reveal other surfaces that can be used also. The requisite requirement is that it be firm enough to withstand the hammering. Cau-



-FIGURE 7-

tion must be used, that it not be overdone. What is wanted, is an unobtrusive surface that will break the glare of a smooth piece of copper, and give a semi-mat texture that will look as if it had always been there. A careful study of Japanese metal work will be a help in learning the right use of textures. Matting tools generally give a labored effect which is bad.

Cut with the shears a strip of sheet metal that will wrap once around the long way of the box, allowing a quarter inch lap on one end, while there is an allowance of enough metal on the upper edge to bend until it reaches the inner lining. As the piece will cover the four sides and contain all the decoration of the body, the design should be worked out at this time. First fit the strip carefully on, allowing the lap to be at a rear corner. Gently tap the metal over the keyhole with the mallet which should give the outlines of it. With a piece of soft wood rub the metal at each corner of the body to make it fit snug. This will also outline the dimensions of each face of the body and show how much space is to be used for the decoration of the faces. Then remove the strip and lay on a pine wood.

If you have decided to use a line effect for your decoration, relying on a harmonious proportion of spaces, the lines should be drawn on the inner surface of the strip with a sharp point. They are then worked over with a chasing

tool and as it is difficult to buy one of the required shape, the method of making it will be given.

Forge or file a piece of  $\frac{1}{2}$  tool steel, shape the end as FIG. 8, cut off five inches. Hold the shaped end in the fire and allow it to heat to a cherry red. A white heat will spoil the steel. Immerse it vertically in water to cool it rapidly. If the steel was really tool steel and had not been heated too much, it should be impossible to make any impression on it with a file. It is now too brittle to be used with safety, so must be tempered. Rub the hardened end on a piece of emery cloth until it is bright about an inch and a half from the end. Heat it at the junction of the polished and unpolished surfaces and watch the colors of the films that form. As the heat is conducted to the end, the films disclose the temperature of it. The first film is a pale straw color, followed successively by yellow, orange, red, purple and blue. When the purple film has reached the tip immerse the tool in the water again. Polish the tool by rubbing it in a crevice in a soft board that has had some rouge sprinkled on it.

(To be continued.)

• •



Fig. No. 19—A, Engraver's ball B, Free space or mortise CC, Walls of ball D, Leather cushion EG, Engraver's tools F, Hammer HH, Steel jaws I, Hole for the handle of the mould.

#### ART IN PEWTER

(CONTINUED)

*Jules Brateau*

#### THE ENGRAVING AND CHASING OF THE HOLLOW MOULD

At the end of the various phases through which the mould of the goblet has passed in most rational succession, there remains another process quite as important as the others, and the final one; that is, engraving and chiseling. This constitutes in itself a peculiar art, which, with rare exceptions, can be practised by specialists only.

The engraver opens the mould, removes the cores and shapes; retaining on his bench only the three parts of the mould proper, on which the design appears in hollow.

He sets up the model before him, together with the three plaster sections which were used in the founding process. He uses an engraver's ball (Fig. 19 A); its top ending squarely and cut out deeply, leaving a sort of mortise flanked by thick walls (Fig. 19 C), one of which is pierced by two thumbscrews passing through the middle space and striking upon the opposite wall. The lower part of the ball rests upon a leather cushion, on which it can turn in any direction. The whole forms a kind of anvil which may be inclined at any angle, and therefore greatly facilitates the work.

The engraver's tools consist of small curved files with



Box in Shagreen and Metal. By J. P. Cooper. Courtesy of International Studio.

## KERAMIC STUDIO

both ends cut for use (rifflers), (Fig. 20, AA), graving tools of all sizes (Fig. 19, E), blunt at one end for the hammer to strike upon or else having a handle to be held in the palm of the hand, like those used in other kinds of engraving (Fig. 20, B B B), a hammer (Fig. 19, F) and chasing tools in great variety, applicable to all kinds of cavities, and which the workman must finish, even often create for himself.

Surrounded by his tools, the engraver begins his task by examining minutely and working upon the inside of the parts which come together.

His experience guides him, and the little tool marks left here and there by the turner, indicate that although the mould seems perfect, it has bent at certain points, especially at the extremities. It has a tendency to curve inward at the edges, as if it had contracted.

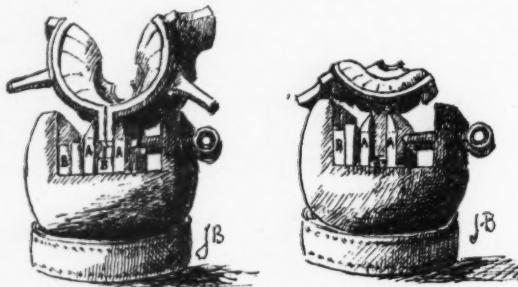


Fig. 19<sup>2</sup> and 19<sup>3</sup>—AA, Steel jaws BB, Iron wedges

The workman takes two sections of the mould and joins them by pushing the round-headed dowels until they project slightly beyond the interior of the walls. Having this point of support, the sections remain strictly in their place. Holding them firmly in his hands, the engraver inserts them in the space hollowed out at the top of the ball. He tightens the screws, and the sections closely joined are thrust against the side of the ball opposite the screws. The two sections of the mould, so held, must vibrate slightly when struck gently with the hammer (Fig. 19<sup>2</sup>).

With file or chasing tool the engraver begins to work at the juncture of the two sections, following the vertical and circular lines of the cylinder and attempting at first only to give the general outline.

Having used the chasing-tool for the heavier part of the work, the engraver now takes a fine file, somewhat flat and bent, and with this instrument smooths his rough sketch. He treats in the same way all three sections of the mould.

Comparing the model with the plaster moulds, the engraver cuts and rectifies with the graving and the chasing tool the parts of the design which stand along the division

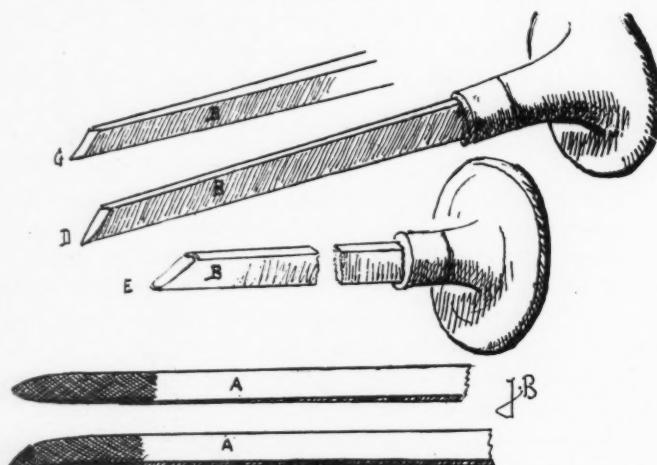


Fig. 20—AA, Rifflers BBB, Burins (general term) C, Chisel D, Burin E, Gouge

lines, and have been adapted to the demands of casting, so that they may be joined easily.

Having made the joints perfect, he smooths the neighboring ground, as well as the whole inside surface of the mould with a stick of wood dipped in a mixture of pulverized emery and oil; or a tool of red copper, adapted to the form of the background, can also be used for this purpose.

The engraver may complain of the smallness of the opening through which his hand must pass; for the mould being divided into three pieces, there really remains but one passage, whose diameter is one-third the circumference of the goblet. For this reason, the division into four sections is more convenient, but the artist will overcome the difficulty with the patience which he has shown on other occasions.

Having unscrewed the grouped sections, he takes them one by one, holding them by the handle, (Fig. 19<sup>3</sup>, see explanation later) and, inserting them in the engraver's ball, he continues the engraving and chasing.

In figure work, at the extremities of the bodies, the strokes of the tools must be given with extreme care; for a single moment of carelessness, or a blow of the hammer wrongly directed, may spoil the entire piece.

Returning repeatedly to the model for comparison, the artist skilfully finishes what the graving tool and riffler were not able to accomplish. He thus passes over all the sculpture, giving it greater animation, correcting the drawing which the process of casting may have injured, but, at the same time, handling judiciously the points of accent, since too much emphasis may result in exaggeration and accidents almost beyond repair.

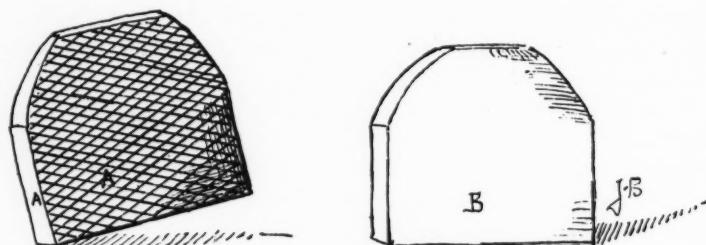


Fig. 21—Steel jaws, soft temper A, Inside B, Outside

As a rule, in making a piece mould, one should begin to work at the joints of the section, so that the general form may be perfect; afterward, the details of engraving and chasing which extend to the centers of the sections should be given attention.

We might here make numerous observations upon the difficulties to be encountered in the course of this work, but the obstacles are never the same. The engraver and chiseler who is often a skilful artist in these two branches, must meet them when they present themselves.

The tray is also placed on the engraver's ball, with its handle held tightly between two steel jaws (Fig. 21); the surface of the latter which is in contact with the object being coarsely cut after the manner of a file. By the aid of iron wedges, the piece is held with absolute firmness (Figs. 19<sup>2</sup>, 19<sup>3</sup>, A A, B B). As the handle is often too long for height of the space hollowed in the ball, a hole is pierced in the height of the space hollowed in the ball, a hole is pierced in the middle of the mortise, upon the flat surface of the ball, so as to afford room for this part (Fig. 19, I).

As in the case of the goblet, the workman begins by cleaning the background with a hard file, or the graving tool, he smooths the work, and follows in the main the processes already described.

The moulds being finished, the engraver closes them, covering the ends with the shapes and the caps for the goblet, and with the counterpart for the tray. He ties them solidly and they are taken to the worker in pewter, to whose studio we shall follow them.

## CASTING IN PEWTER

## PREPARATIONS NECESSARY TO FINISH AN ARTISTIC PIECE OF PEWTER

On entering the workshop of the founder, we observe first of all a stationary, isolated furnace (Fig. 22). It supports a strong iron pot in which the metal is melted (Fig-

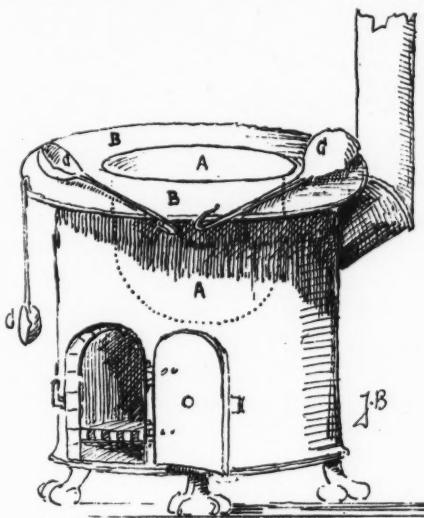


Fig. 22—A, iron pot; B, circular table, flat rim; CCC, iron ladles

22, A). The edge of this kind of crucible is level with the flat top of the furnace, which serves as a circular table (Fig. 22, B B).

The furnace is heated with charcoal, wood, or petroleum; the combustible itself being unimportant, provided that the resulting heat be strong enough to produce fusion, easy to control and of sufficiently long duration.

On the furnace there are ladles of various sizes, having small spouts or beaks at the sides (Fig. 22, C). Near the furnace and in the heat lie several lingots of pewter, all of the same alloy which the founder has chosen to adopt; these lingots being provided in order to maintain without interruption the same quantity of molten metal, and in case of too great heat, to lower its temperature.

These variations are recognizable by the founder; the metal when too hot, changes color. It becomes yellow and blue, it wrinkles and develops at the surface a more abundant froth, which is removed and set aside. Formerly metal in fusion was covered with pieces of charcoal, which were put on and taken off, according as it was desired to hasten, or to retard liquefaction.

Near the furnace stands a gas, or a charcoal stove, used to heat the separated parts of the mould. When these sections reach the required temperature, they are glazed, and securely put together, so that the pewter may be poured into the thus completed mould.

Subjoined are the principal alloys for pewter, with a statement of their qualities:

## I. White, pliant, vibrating, sonorous:

Pure tin (Banca, Malacca, Detroit,

etc.) ..... 90 parts

Regulus of antimony ..... 9 parts

Red copper ..... 2 parts

## II. Having nearly the same properties as the first:

Pure tin ..... 88 parts

Regulus	9 parts
Red copper	3 parts

It is possible to vary these alloys, but the formulae just quoted give good results in artistic pewter work. Other names could easily be given, but I do not think it possible to vary greatly from these quantities, if the metal used be genuine tin.

Subjoined is the formula used by the pewterer Salmon in 1780; the metal, in this case, was desired to be pliant and malleable:

Pure tin, 100 pounds	50 kilos
Reddish copper, 1 pound	500 grammes
Bismuth, $\frac{1}{2}$ pound	250 grammes

Not far from the furnace stands a solid table with strong legs, upon which to take apart and put together the moulds. A basin holds the glaze which is applied with a soft brush to the inside walls of the mould, so as to prevent the pewter from adhering to the copper.

This liquid glaze is composed of red, or yellow ochre, or of light clay, etc., finely pulverized, and capable of remaining insoluble in a large quantity of water.

We also need clamps, and spring-pincers which seize the extremities of the mould and tighten them; for it is important that the cores do not separate and loosen the shapes, which must be strongly held.

The instruments which serve to hold the moulds in all their parts, vary according to the forms of the latter. It is, above all, necessary that they be easily applied and removed, because the process of casting is rapid.

Several mallets of soft wood to aid in removing the piece from the mould, must be within reach of the hand; as also a pointed knife with dull blade, together with pieces of felt cloth for holding the heated object.

All these accessories are useful, for they aid in removing the parts, which after the casting, would press too tightly on the shapes, or at the neck.

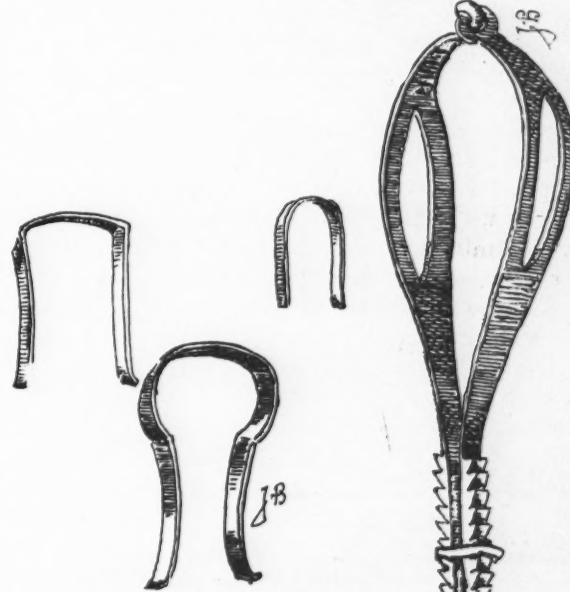
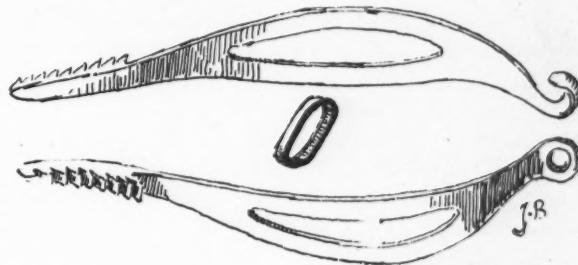


Fig. 23—Pincers for moulds.

At the foot of the table a tub of rather hot water is placed, together with a swab of cloth, or a swale.

Each part of the mould warmed upon the stove, is sufficiently heated when a drop of water thrown upon it crackles and evaporates. Another test is made by applying a piece of cold pewter, and if this melts, the mould is too hot, and must be allowed to cool somewhat.

With a light stroke of the mallet the workman fastens to the stem of each section a short, rounded piece of wood, which allows the part to be handled easily. Then each section, when warmed, is drawn near the vessel containing the glaze, and coated quickly with the solution of ochre; shapes, caps and funnels or necks, care being taken to make the coating of the same thickness on the flat surfaces as in the hollows. To do this a hard brush will be found serviceable.

Now the workman quickly puts the mould together without striking the pieces; taking first the principal core; the stem of the shape lying on the table. Then, putting the pieces in the frame, each in the place which it is to occupy, he covers the whole with the caps that is, the core of the foot of the goblet. Next, rapidly turning the pieces on one another, he makes sure that they fit precisely and he tightens the whole with pincers, or clamps, according to the nature and the form of the mould. He places

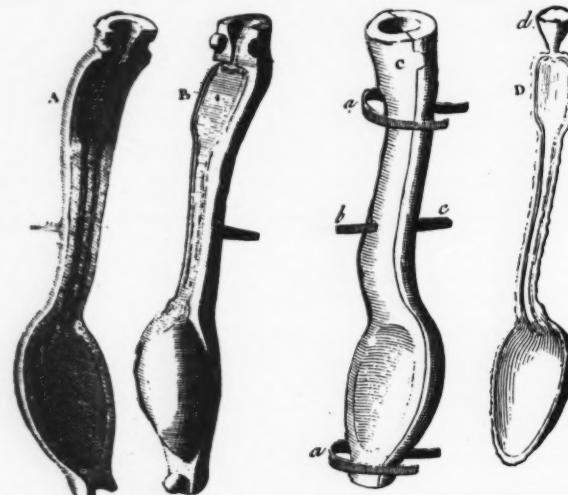
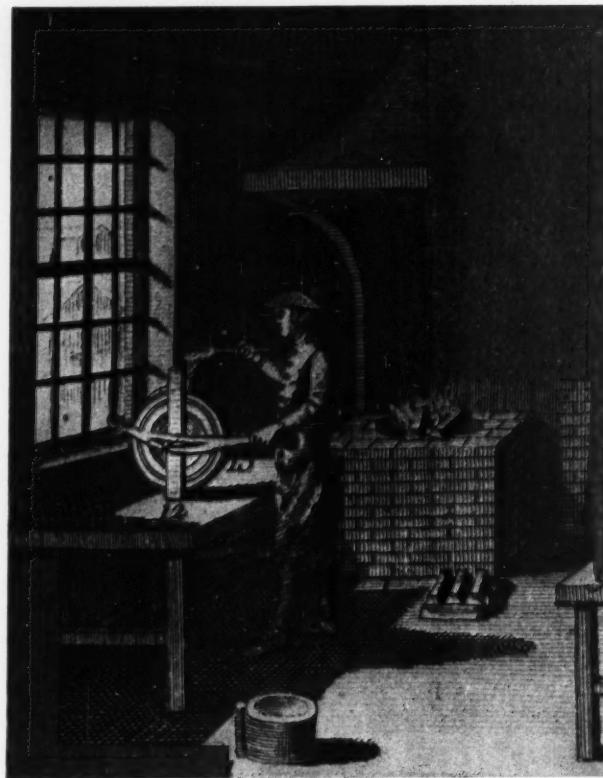


Fig. 24—Example of pincers applied to the mould of a spoon (from Salmon's treatise, 1788). aa, pincers; bb, handle; cc, dowel; AB, mould, opened; D, pewter proof as it comes out of the mould.

the mould so that the neck or funnel is at the top, and that the pewter may be easily poured into it. The mould is kept on the bench in the correct position as above indicated. With his free hand the workman takes a ladle large enough to contain the metal necessary for one object, and he dips it into the molten mass, which has been thoroughly purged of foam and left bright and clear. Resting the spout of the ladle upon the edge of the neck, he fills the mould until the metal reaches the surface. He waits a few moments, and if the metal sinks by thickening, he adds to it. He pours what remains in the ladle back into the crucible and lays the former upon the circular table. Now, taking the swab and squeezing from it the surplus warm water, he applies it first on one side and then on the other of the mould, especially at the juncture of the neck with the object, since that is the hottest part. This he continues to do for some time, tapping over the whole mould. The cooling process may be accomplished also by compressed air brought through a tube ending in a nozzle.

The cooling is indicated at the mouth of the funnel, or neck, when the pewter loses its brilliancy and whitens.



Illus. No. 56—Pewterer pouring pewter into the mold of a tray held by pincers (from Salmon's Treatise, 1788).

The casting is finished.

If the moulds are small, they can be held between the knees of the founder. This manner of casting is employed for casting spoons.

(TO BE CONTINUED)

#### ANSWERS TO INQUIRIES

Horn is carved with gravers. Look for the grain and before working soak it for several minutes in very hot water. Carve your design on the curved side, it will be easier to shape. Tortoise shell can be bought in blanks the size and shape the comb is to be. It is carved also with gravers, a metal saw is also used the same way as for metal. A maker of tortoise shell combs will polish and shape the comb. He will also cut the teeth in it much more easily having all the proper equipment. The tortoise shell must be kept in salted water for a time before it is carved.

MRS. C. F. O.—Try the recipes given for making colors in the article on Batiks, by Theo Neuhaus, in the May issue, 1907. They are non-fading and I should think could be used with a block.

M. I.—Ivory can be dyed by any of the ordinary methods used for silk and wool, though it must be perfectly clean before it is put into the dye bath. When it is taken out of the boiling hot dye it should be plunged immediately into cold water to prevent the chance of fissures being caused by the heat. Bone for ornamental purposes is treated in the same way.

MRS. F. J. M.—Niello or black inlay for metals comes in sticks like sealing wax. Send to J. Kricue, 88 John St., New York City. If he cannot supply you he probably can tell you who can.

T. C. C.—Soft copper and brass can be obtained from Patterson Bros., Park Row, New York City or Hungerford U. T. Brass & Copper Co., Pearl and Park streets, New York City.

M. B., East Liverpool—The tjanting or wax vessel spoken of in the article on Batiks is made of brass. It is not probable that they are made in this country, but a tinsmith could make one from the illustrated sketch in the May issue. He could better tell you about the cost of it.

#### SAGITTARIA (Page 277)

(Photograph by Helen Pattee)

*Henrietta Barclay Paist*

THE Sagittaria (Arrowhead Lily) flower is pure white with yellow center. For the panel a soft greenish grey, made by tinting delicately over a grey tint with Moss Green, will make a pleasing background.

For the design use three tones of green, leaving flowers white with the yellow centers. The paths around the design are of Silver or Green, Gold outline for the last fire with a Dark Green or Black line. For the green mix Grey Green and Dark Green. Tint and dust the background to make it stronger; the leaves need not be dusted. The Grey Green alone, or tinted lighter, will make the lower panels. The stamens of the flower are Black or Dark Green.

This treatment will require three fires. The design is intended for a cylindrical vase.

#### ANSWERS TO CORRESPONDENTS

F. L. W.—The snow study in KERAMIC STUDIO could be rendered by shading with Copenhagen Blue with Violet, leaving the china for high lights. The branches should be a purplish brown, use Banding Blue, Ruby and Yellow Brown with Black in shadows. Make the sky a Grey Blue with a touch of Blue Green. Be sure that your branches are not hard at the edges.

MRS. D. G.—We can make no exceptions about answering questions. These are answered only in the magazine. In executing the plate with the wheat border in gold, the narrow black band inside rim should have wheat in gold, in which case the design must be picked out before firing and the gold applied for a second fire, or the design may be applied in raised gold where the paint has been removed, and gilded in a second fire. A gold band with the design in white picked out or in white enamel would also be good. In any case the band must be well dried and the paint removed from the design before further treatment.

C. F. B.—Yes. Lustres may be used upon Belleek.

F. D.—Lustre comes from the kiln spotted when dust has been allowed to settle on the china before firing. Also it is caused by moisture in the kiln. Usually, however, it is caused by dust and is prevented by drying the lustre rapidly in a clean oven or over an alcohol lamp and wiping carefully with an old silk rag before firing. You will find the subject of lustre decoration exhaustively treated in the Class Room articles KERAMIC STUDIO, February and March, 1906.

To mend a broken piece of china, the piece must be taken out and the cement applied, then put in place and tie with asbestos cord if it will not stay of its own weight.

See article in this number on preparing designs for illustration.

M. C.—When the peep holes of the kiln are not left open long enough for the moisture to escape, it condenses on the china leaving a light spot with a rim of darker color, an effect similar to that made by spattering drops of alcohol before firing.

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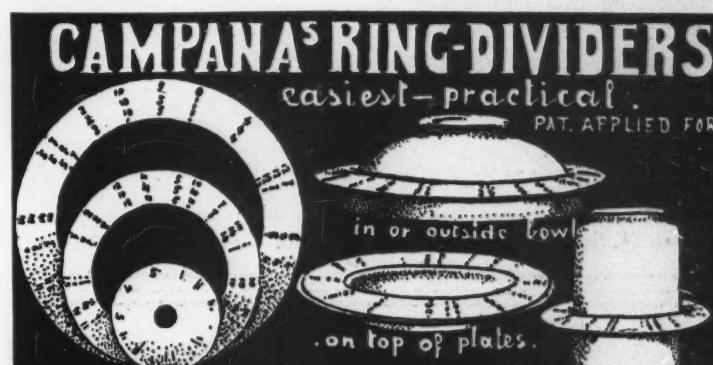
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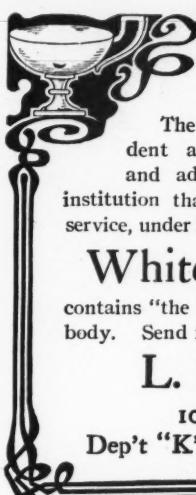
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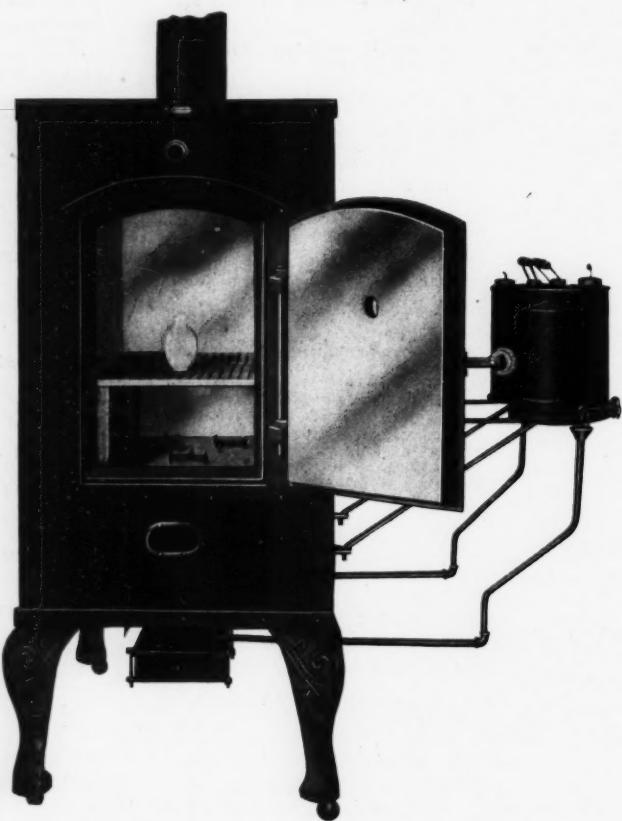
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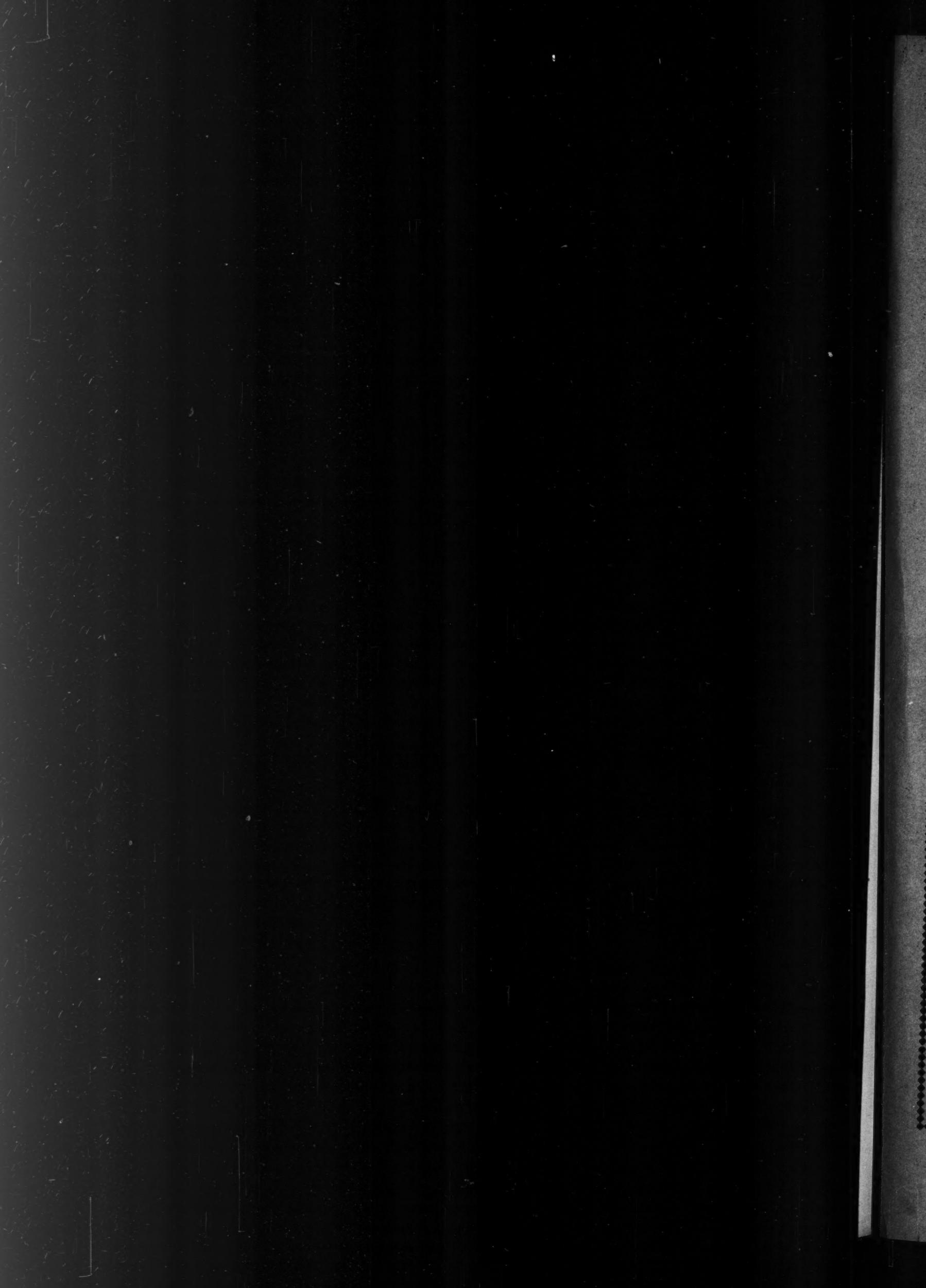
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